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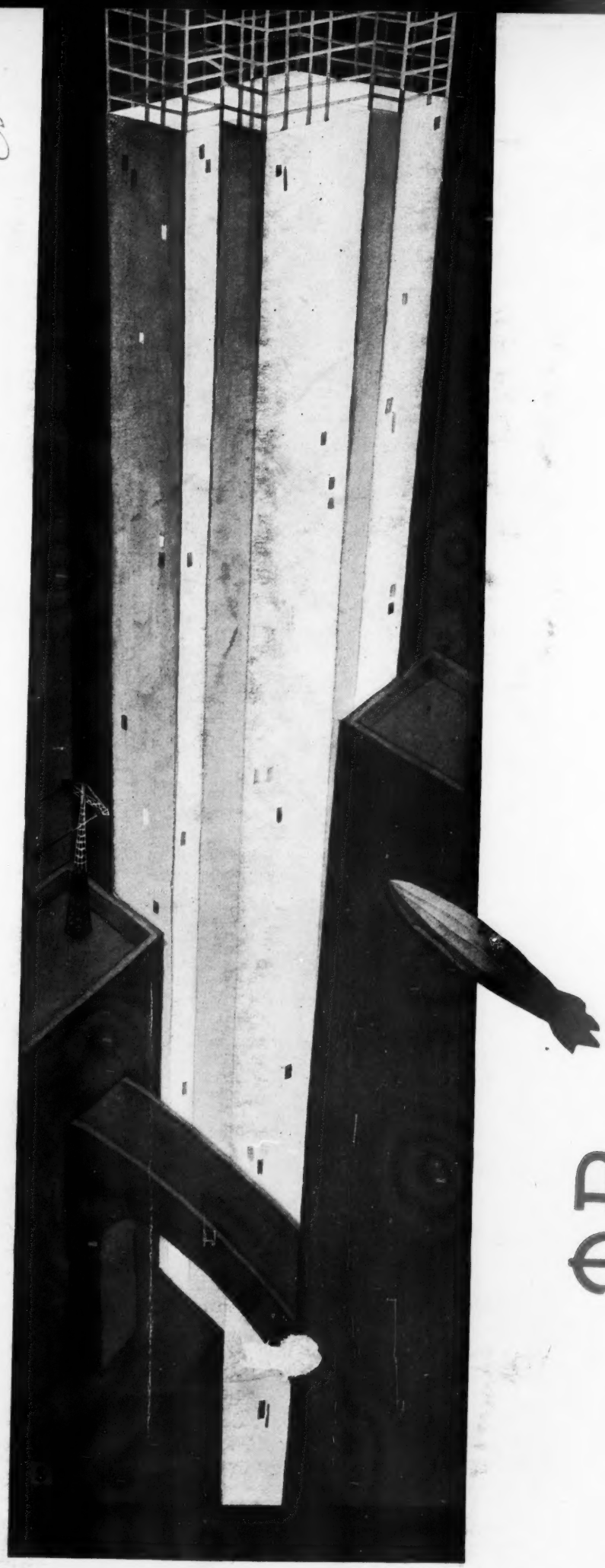
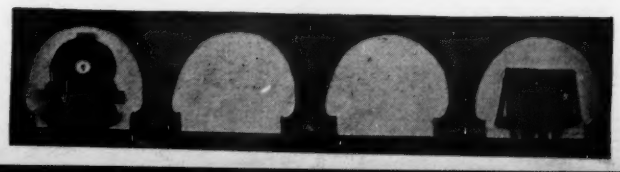
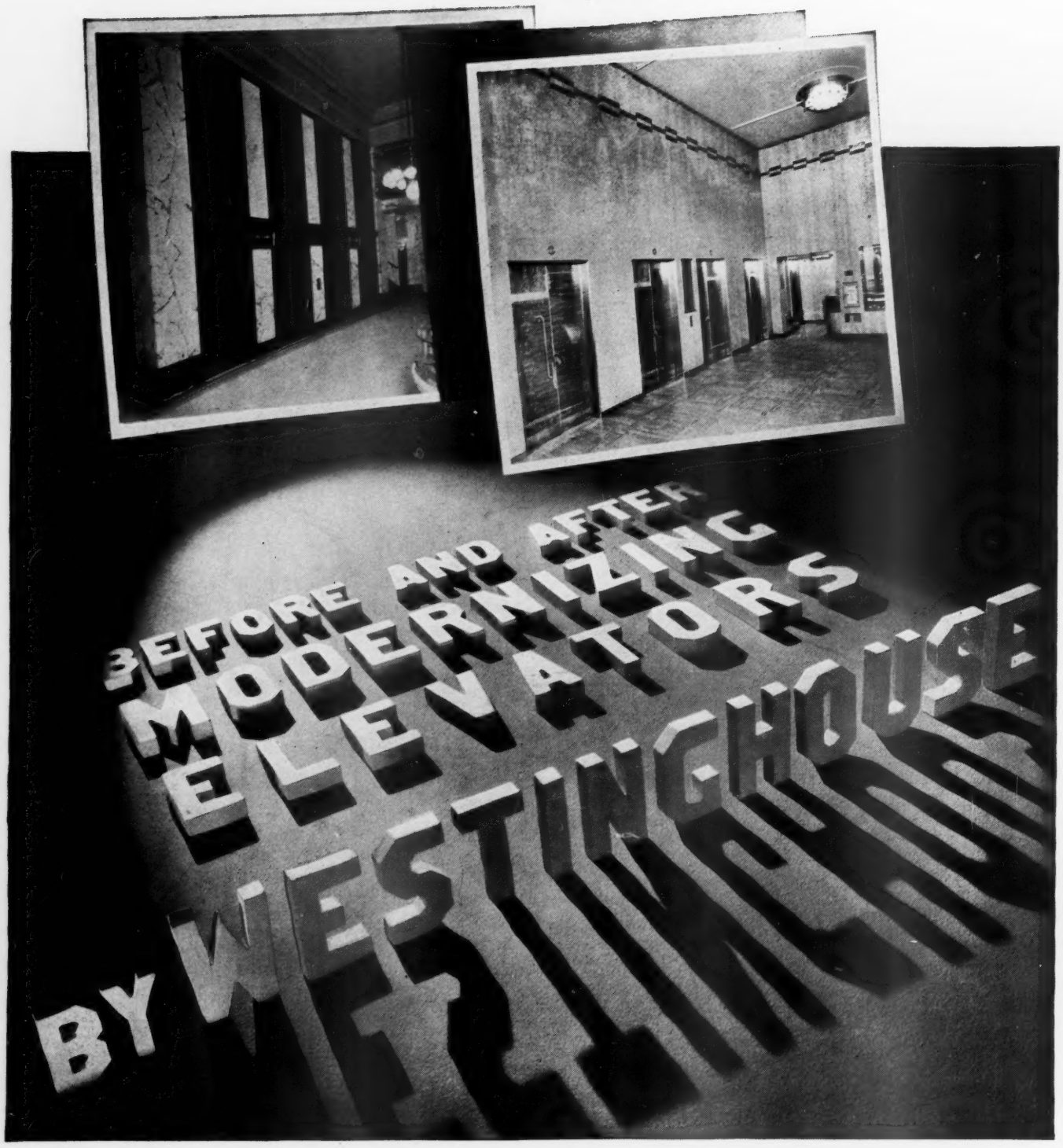


The AMERICAN ENGINEER

JULY - - - 1933





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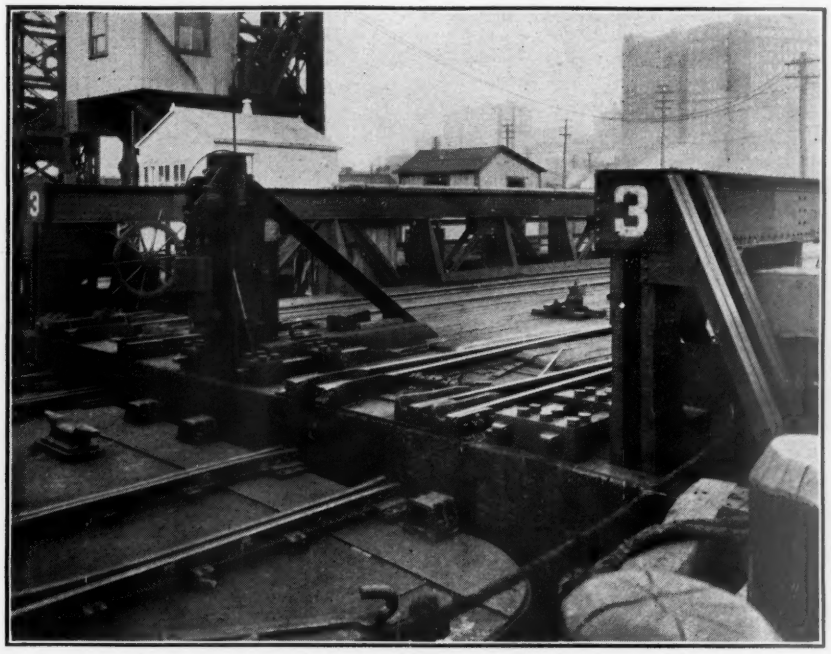

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NUMBER 7 JULY, 1933

CHICAGO PLAYS HOST TO THE ENGINEER

Greatest Assemblage in History of the Profession

Should Be Repeated Annually

WHAT was probably the most comprehensive gathering of Engineers ever recorded, either in America or abroad, took place in Chicago during the week of June 25th to July 1st.

Several thousand civil, mechanical, electrical, chemical, mining, industrial and other engineering specialists participated in the deliberations and programs conducted by some fourteen societies of national scope, including the American Association for the Advancement of Science, and several of recognized sectional significance.

Welcomed by the Mayor of Chicago, the Hon. Edward J. Kelly, himself an engineer, the profession, through its many agencies, conducted its conclaves and participated in the social life of the great mid-western metropolis in a manner that could not have been surpassed by any organization in the country. Offered the keys to the City by its Mayor, and extended every courtesy by its citizens, engineers who were fortunate enough to be present have every reason to recall with pleasure their stay in Chicago. The meetings, discussions, inspections and social activities covered one entire week, and to record even a small part of the program would be a task that the specially assigned correspondent of the New York Times, William L. Laurence, confided to the writer was beyond any reporter.

Wednesday, June 28th, was designated as Engineers' Day at the Century of Progress Exposition. In the morning there was presented to Juan de la Cierva, the inventor of the autogyro, amidst the pomp of military and ceremonials appropriate to the occasion, the Daniel Guggenheim Medal for Aeronautical accomplishment. The presentation took place at Soldiers Field and was witnessed by some thousands of spectators. The ceremonies at the stadium were followed by luncheon and an afternoon given over to the attractions of the Exposition.

Approximately 1,000 persons attended the dinner, held in the Stevens Hotel at seven in the evening. Sponsored by fifteen societies this was probably the most significant event of its kind within the knowledge of engineers. A welcome in behalf of the City of Chicago was offered in the name of Mayor Kelly by the Commissioner of Public Works. Addresses of unusual merit were delivered by Edward J. Mehren, President of the Portland Cement Association, and by Dr. Karl T. Compton, President of the Massachusetts Institute of Technology. Copies of these addresses appear elsewhere in this issue. Harry B. Gear, President of the Western Society of Engineers, which Society was host to the visiting groups, presided during the banquet, which was followed by dancing.

Aside from the conduct of business sessions, the schedule afforded ample opportunity for visiting the Century of Progress Exposition, the parks, lake front, water works, disposal projects, transportation facilities and countless other objects of particular interest to engineers.

For a week the profession was on display. There is every reason to believe that Chicago was as impressed with the Engineer as was the Engineer with Chicago. Entering fully into the carnival spirit of the city cannot fail to have a favorable reaction. As Mayor Kelly said in one of his addresses "the Engineer must, in future, appear more often in public. In Chicago he will henceforth be identified with his creations and his name will be inscribed in places heretofore restricted to public officials." The Chief Executive of Chicago is an engineer of whom the profession has reason to be proud. Would that there were more engineers in high places and that those who did attain places of responsibility were as concerned with the welfare of the professional engineer as is Mayor Kelly.

It will probably be many years before another such opportunity presents itself, but the profession would do well to bring about occasional conventions of engineers, wherein all branches could meet on common grounds. Instead of four separate meetings of the several national societies each year, why not make one of those meetings

(*Continued on Page 16*)

The Fiftieth Anniversary Of The Brooklyn Bridge

An Epoch Making Event in Engineering

By D. B. Steinman

FIFTY years ago, the opening of the Brooklyn Bridge was celebrated. It was a most significant event in the history of New York, of the United States and of the Engineering Profession. Even with the perspective of half a century, it is difficult to grasp the full significance of this world-famous structure, not only in the development of the great city of New York but also in the story of human progress and achievement.

The Brooklyn Bridge is not a mere prosaic object of utility and economy; it is something far more significant and inspiring. This bridge is more than a thing of steel and stone; it is the embodiment of the effort of human heads and hearts and hands. It is more than a thing of stresses and strains; it is the fulfillment of human dreams and hopes and aspirations. It is a symbol of Humanity's heroic struggle toward mastery of the forces of Nature. It is a monument to Mankind's indomitable will to achieve.

The story of the Brooklyn Bridge is a heart-stirring narrative of high adventure and deep dramatic interest. It is an epic of human vision and courage, high hopes and disappointments, heroic effort and inspiring achievement. It is a story of men's dreams, of their faith, of their struggles, of their tragedies, and of their final glorious realization.

Our half-century of retrospect is balanced by a preceding half-century of longing and anticipation. For fifty years or more, public-spirited citizens of this community talked and dreamed of a bridge to overcome the water barrier between Brooklyn and New York. Vague proposals were made, but were dismissed as unpractical. A span of that magnitude seemed to be beyond the realm of human possibility. Each time new hope was aroused, it gave way to repeated discouragement. Men shook their heads and said "It cannot be done."

But in 1857 there appeared a man who said "It can be done!" That man was John A. Roebling. He addressed a letter to Abram S. Hewitt declaring the feasibility of constructing a mighty span between the two cities, without impairing the freedom of navigation. The letter was printed in the New York Journal of Commerce. It commanded attention because it came from an Engineer who had already demonstrated his ability to conquer the impossible in the building of great spans. Nevertheless many were incredulous, others were ignorant or prejudiced, and the years rolled on.

After the Civil War, interest in the project was revived. In 1866, a small group of Brooklyn citizens met in a room at the "Owl's Head" and resolved to take the necessary steps for the authorization of a bridge. In this group were Henry C. Murphy and William C. Kingsley, who became the "Fathers of the Brooklyn Bridge."

That winter was the most severe in the history of the City. The river was so choked with ice as to render the ferry service helpless. The people began to clamor for the immediate construction of a bridge. It was pointed out that a man could travel by rail from Albany to New York in less time than required for the ferry trip from New York to Brooklyn. Backed by public opinion, Senator Murphy, who had been formerly Mayor of Brooklyn, secured the passage in 1867 of a State Bill incorporating the "New York Bridge Company" for the purpose of constructing a bridge over the East River. The company was promptly organized, with Mr. Murphy as President. Their first problem was the selection of an Engineer to make the necessary surveys and prepare the plans. Destiny had provided the man and wisdom guided the choice. On May 23, 1867, John A. Roebling was appointed Chief Engineer of the project.

The Brooklyn Bridge was the crowning achievement of that pioneer master builder—John A. Roebling—a monument to his vision, courage and genius.

Born in Germany, educated in engineering and philosophy at Berlin, he came as a youth to this country, bringing with him the unquenchable spirit of the pioneer. His only capital was character, energy and courage. He went into farming, but soon became restless and decided to apply his engineering training by building the first wire and wire rope plant in this country. He then conceived the idea of using his wires for the building of suspension spans, and he proceeded to develop the modern method of constructing parallel wire cables by stringing the individual wires from shore to shore. He first applied this method to the building of short spans to carry canals and aqueducts, and then he was emboldened to undertake longer and more difficult spans.

In 1854 he completed the Railway Suspension Bridge across the Niagara River, with a main span of 825 feet. This was the first suspension bridge ever built to carry railroad traffic. After nearly half a century of service, covering a period of rapid increase in the weight and length of trains and locomotives, this bridge was carrying 2½ times the loading for which it was designed.

In 1867, Roebling completed the Ohio River Suspension Bridge at Cincinnati, with a main span of 1,057 feet. This was at the time the longest span that had ever been attempted.

Those great achievements in bridge engineering, however, were for Roebling but preliminary training for this greater work that was to cost him his life while crowning it with glory.

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What A College Of Engineering Should Train For (Certainly not good English)

Suggestions Born of Observation

From An Address Delivered at Milwaukee
By Dr. E. R. STOEKLE

To enumerate a list of special branches of engineering and to discuss their relative value to the engineering graduate when he takes his place in industry, is a task to which the writer brings no pretensions of qualification. That an engineering college should select men with engineering talent and train them to do engineering work appears to be a safe response to the question implied in the title.

It must be realized that a man out of school almost twenty years and gradually changing from research engineering to the more commercial types of industrial work, has not been able to keep up with the most modern thought on engineering training except through his frequent interviews with the young products of this training. It must likewise be recognized that every expression of opinion is subject to honest criticism and the views herein set forth are of course no exception.

Believing that his position is entirely tenable the writer would begin from the premises that specialized technical training in an Engineering College can not hope to fit the young graduate to give immediate concrete technical advice to the diversified industrial environment. With the great specialization met in our manufacturing industries, it is hopeless to expect an Engineering College to qualify a man to step into a highly specialized industry with a knowledge of its particular problems. The training which industry expects from the College of Engineering is that it will furnish men trained in the fundamentals of science and engineering with the ability to think in the scientific and engineering manner.

Of first importance in an engineering training, whether it be for a life work of creative engineering or executive engineering, is a knowledge of the fundamental sciences. A boy who does not show more than average interest in the natural sciences should be discouraged from an engineering career as early as possible.

Physics and chemistry have been and probably always will be, the basic sciences of engineering. The Physical and Chemical research of today form the basis of the Engineering progress of the future. This is true in spite of the abstruse theoretical nature of modern physics. Physical theory in delving into mathematical analysis of the structure of the atom may seem to have left the engineer somewhat bewildered, but such theorizing is always followed by intensive experimentation to bring the theories back to reality, and then the engineer takes a sudden and very significant interest in the theory.

Perhaps that is why we witness at this time engineering schools such as the Massachusetts Institute of Technology, building a 20,000,000 volt electrostatic generator on a new principle to be used in experiments for disrupting atomic nuclei. Also, we see such men as C. C. Lauritsen, former Chief Engineer of the Colin B. Kennedy Radio Co., researching at California Tech. and constructing high voltage vacuum tubes, also for the purpose of disrupting atomic nuclei. New applications in modern electrical engineering such as the electron tube, are the direct results of the intensive interest and activity of physicists of the late 19th century in the electron after its discovery by J. J. Thomson.

As for the place of chemistry in engineering, we might well say that perhaps the greatest future progress in all branches of engineering will depend upon the utilization of new materials made available as a result of chemical research.

It is common to consider mathematics as another of the basic sciences for engineering. This is true only insofar as mathematics provides a very powerful tool to the scientist and engineer in achieving a more accurate understanding and application of the laws of nature. Mathematics is essentially analytic and can only create ideas of engineering value when combined with a synthetic imagination applied to the natural sciences such as physics and chemistry. Therefore, at the risk of appearing presumptuous the writer believes that a mastery of mathematics is somewhat overrated in our modern engineering training. Special aptitude in mathematics does not in itself qualify a boy for an engineering training. Michael Faraday's deficiency in mathematical aptitude would probably have prevented him from obtaining his degree in an engineering or scientific course such as offered by our modern Universities, yet there would probably be no sciences of Electrical Engineering or Electro chemistry without his keen intuitive perception of scientific truth coupled with his creative imagination. One sometimes wonders how many potential young Faradays are being "flunked out" in the sophomore year of our engineering schools. Even worse than being "flunked out" is the example of those who, through a sense of duty to their professors and to their parents at home, sacrifice their creative scientific imaginations to the formularized training that is handed out to them, and get a degree and a stultified intelligence but never do anything in the future worth being remembered by the world.

What can an engineering training do to keep a boy true to himself and to whatever genius he

(*Continued on Page 17*)

To Stabilize Or Not To Stabilize

Monetary Revaluation as Viewed by An Engineer

Admiral Frederic R. Harris

WILL we stabilize the dollar? Will we go back on the gold standard? These are the questions of the day in London and all over the world.

When most of us read about this topic, especially if we think much about it, it probably makes the same impression on us as did the daily tirades, in the press of two or three months ago, as to whether people would be better off if the dollar were weak or strong. Many did not know what that was all about, and depending upon the newspapers they read, a weak dollar was a calamity, or a strong one a harbinger of a disintegrating business structure. The writer discussed this subject over a nationwide broadcast early in April and at that time foretold that we were going to have the equivalent of inflation or value adjustment to money price, and that inevitably, sooner or later we would have to go off the gold standard.

Now, on the question—to stabilize or not to stabilize, in fact on the whole question of finance and money, foreign exchange and foreign trade—unfortunately, as a people, we are not especially well informed. We do not think much about it and until recently we did not read much about it, and there is a very good reason for this. Ours is an isolated country, self-contained. Our business and our trade, even in prosperous times, was 90% internal—foreign trade and foreign exchange interested only a few of us. This is not so with Europeans. In these older, smaller countries, speaking different languages, with neighbors close by and having different customs and different moneys, a great deal of their business is—because they are not self-contained and self-sustaining—trade with each other—foreign trade, and daily contacts with other nations involves a knowledge of other nations' money and the exchange of moneys.

Our wealth and prosperity is founded on the almost inherent desire for personal independence through which we have developed an individualism. Americans, especially engineers, become engrossed in their special job, their business, or their profession, and they feel they cannot afford to spend time and effort on what seem to them to be matters and questions that do not concern their own business and welfare. The average American wage earner or business man may be differently educated and differently trained from his foreign cousin, but he is just as keen and intelligent. However, conditions here have directed this keenness and intelligence into narrower, more confined fields. Until lately, if you tried to explain the science of money and foreign exchange to the average American you would probably be told "That is completely over my head—I have not the time, nor am I interested in things of that sort."

We shall have to change our views on such matters. There is little use in making a success of one's job, making money in one's business, and being frugal, saving some and investing it in a home, insurance, or other things, unless this application to work, to business, and of frugal habits brings security. There is little use in saving and investing if the savings of a life-time are to melt away and disappear because the business, financial, or money system of the country is faulty. Or, to state it in another way—of what avail are American habits and endeavors if the people of other countries, jealous of our prosperity, wealth and high standard of living, by manipulation of their money and financial system can find a way to destroy our business and our investments, and even deprive us of the opportunity for work.

To retain our cherished institutions, our freedom, and our individualism, we must realize that a democracy with the elections of officials who direct and control affairs is decided by the majority vote of a citizenship who should be enlightened and informed on public questions. We must understand that while these are general, they affect each and every one of us vitally, and may make or break us overnight. For a more stable success in the future, we must have an enlightened public opinion. People must take the time to inform themselves on vital questions of national policy, and the most important of these is the question of money.

Many Americans still think that money is wealth—that it is a basic measure of value—that it does not fluctuate in value, but that other things fluctuate in relation to it—that prices go up or prices come down, but that their money—the dollar—always remains the same. None of this is true. We might as well realize that when prices go up, what is really happening is that money goes down—its purchasing value becomes less, and when prices go down, money is going up and its purchasing value is greater. Money is not a natural thing. It is purely a device of man—an invention or development of his. It might even be said that it is not absolutely necessary for a modern society to have money. There have been stable, long-lived civilizations in the past that existed without any money, and there may be civilizations in the future that will exist without the money device.

Gold was first resorted to, because it was a rare metal—costly to produce and while comparatively soft, was stable and was not readily oxidized by the air or corroded by acids. By the ancients, it

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A Century Of Civil Engineering In The United States

By Alonzo J. Hammond
President, American Society of Civil Engineers

Address at the Sixty-third Annual Convention of the American Society of Civil Engineers, Chicago, Ill., June 27, 1933

"WHEN the mariner has been tossed for many days in thick weather, and on an unknown sea, he naturally avails himself of the first pause in the storm, the earliest glance of the sun, to take his latitude and ascertain how far the elements have driven him from his true course."

These immortal words of Daniel Webster, uttered one hundred three years ago, as a part of an oration, one of the most eloquent, forceful and momentous in the annals of our history, established firmly the doctrine of government as the independent offspring of the popular will.

For the purpose of drawing a more striking picture of the advance in Civil Engineering in the past century, let us for a moment divert our attention to that of Finance, a subject we all like to discuss and of which we all know little. As Mark Twain said of the weather, "We all talk about it but no one does anything about it."

Let us draw the veil and see the banking picture of a century ago and compare it to the present situation, having in mind our recent bank holiday.

The Bank of the United States had been first created in 1791, on plans suggested by Alexander Hamilton and opposed by Thomas Jefferson.

Mr. Jefferson's party allowed the charter of the Bank to lapse in 1811, when the day of their power came, professing themselves opposed to it on principle, but in 1816, we find the exigencies of finance powerful solvents of their scruples, they had changed their minds and had given it another charter running to 1836.

General Andrew Jackson came in, in 1828,—"to simplify and purify the workings of the government . . . to promote its economy and efficiency and to maintain the rights of the people and of the states in its administration,"—so from the outset he looked upon the bank as an enemy of constitutional and democratic government.

The Bank was the depository of the Government, so to cripple it, he found it necessary to change and dismiss two Secretaries of the Treasury and finally found a pliant tool in Roger B. Taney, who issued the necessary order in 1833—a century ago —that all revenues should be deposited in State Banks and the deposits should gradually be withdrawn from the Bank of the United States.

There was immediate distress in the money market, a sudden flutter of credit and only the sound condition of business at the moment prevented crisis and disaster.

The government deposits went to State Banks, which became banks of issue, so that paper money seemed to pour of a sudden from every town and hamlet and speculation became a riot. The bubble of credit glistened resplendent with all the hues of a round globe, until General Jackson pricked it in 1836 by demanding that land agents of the government accept nothing but gold and silver in payment for public lands. The whole fabric of credit was shattered and was followed by the depression of 1837—one of the worst in our history.

What have we learned in finance in one hundred years?

The Bankers' panic in 1907 caused a demand for new laws, resulting in the Federal Reserve Act of 1913.

That the Federal Reserve Banking System, as operated, has proven miserably inadequate to protect our banking institutions and credit facilities is of so recent an occurrence as to require little or no comment.

In 1928 and 1929 when speculation ran riot and the wealth of the world was pouring into Wall Street to cover the turnover of millions of shares of securities every day, rediscount paper of country banks furnishing money for legitimate business was called, that the insatiable maw of speculation might be appeased.

As in 1837, we were led into disaster and a resulting worse depression than a century ago.

I have purposely presented this picture of similarity of conditions in finance prevailing a century ago with those of today, in order that we may give some serious thought to the future of our financial structure. Our idols have crashed, our financial wizards have faded, but have we in the making a structure safe, sound, and solid as Gibraltar?

Another reason that I have had, is in making a comparison of the state of the Art and Science of Civil Engineering of a century ago with that of today. I have used the word Art as prior to Science advisedly, as among the earlier of our structures, outside of the benefit of previous practical experience, the designer depended largely on his judgment which made of his product an art rather than a scientific production.

What was the state of the Art of Civil Engineering in 1833?

What has been the advancement of Civil Engineering during the century we are now celebrating, at the Chicago Century of Progress?

What have been the influences at work of benefit to our civilization? To make our lives more livable, happier and more secure.

As expressed in my opening quotation let us pause, look around and take stock of what the

(*Continued on Page 18*)

The Century Of Progress—What Next?

By Karl T. Compton

President Massachusetts Institute of Technology

(Address at Dinner of Engineering Societies, Chicago, June 28)

THE consummation of the plans for the Century of Progress Exposition, carried out in the very depths of the worst economic depression of recent history, deserves to be classed with the "seven wonders of the world." Beneath and back of its bewildering display of the principles and applications of science, to the accompaniment of amusement and modernistic art, and back of the evident desire of some millions of people to spend time and money to visit this exposition, there lies —something significant. The exposition is a great phenomenon, and every phenomenon has a meaning

While the Century of Progress Exposition has innumerable aspects, four appear to me to be fundamentally significant. In order of importance they are: (1) It is good publicity and business for the city of Chicago; (2) it is a monument to the world's most striking achievements of the past century; (3) it is an immense educational enterprise, exposing and interpreting the new aspects of our environment and life which have arisen so rapidly from the applications of science; (4) most important of all, its symbolizes a prophecy for the future. Let me briefly discuss these four aspects.

I. Publicity for Chicago

It is not invidious to remark that Chicago can stand some favorable publicity. It has had a reputation of smoke and dirt, as immortalized by O'Henry when he wrote that he was born in Chicago, but first saw the light of day five years later in New York. It is a city of racketeers and gangsters. An engineer whose name you would all recognize, came to Chicago several years ago to superintend the installation of a new type of underground high voltage cable. Just as he emerged from a man-hole, at the completion of his work, a couple of automobiles went racing past to the accompaniment of machine gun fire. A few months ago the banks of Chicago were stormed by school teachers, desperate for their pay. There is reputed to be some occasional graft in Chicago, though this must be at the expense of racketeers and not by misappropriation of tax money, because, from what we hear, people don't pay taxes in Chicago.

All this and more is the popular conception of Chicago. But what do we find when we come here? There is no greater concentration of smoke in the city than we manufacture for our own comfort in this room. I have walked miles of street by day and night and have not seen a single person shot,—literally or figuratively. There seem to be no riots of school teachers, though this may be because it is vacation time,—or more probably because by this time they are too undernourished and underclothed to be able to appear on the streets. And as to taxes, you and I and others like us are scattering a lot of money around the hotels and stores of Chicago, and this ought to help. So I think that some millions of people will go away from Chicago to spread the gospel of a beautiful, pure, prosperous city, evidently turning over a new leaf on its one hundredth birthday.

II. Monument to the World's Century of Progress

The urge to erect monuments to our achievements appears to be one of man's most deeply enrooted instincts. It is partly an innocuous expression of pride, and partly an expression of the teaching instinct, the inherent desire to show and tell others. Perhaps it may also reflect man's instinctive desire for immortality. However this may be, the savage recorded his kills by scalps in his belt or notches in his gun, the Egyptian recorded his greatness by a pyramid, the farm country displays its produce in the county fair, the Roman emperor boasted of his conquests by a triumphal procession. Why should not Chicago business men, with cooperation of the National Research Council, industrial organizations and political units display the Century of Progress? Especially why should this not be done if, as it is hoped and as it seems probable, you and I and others like us have the fun and pay the bill, and incidentally help the railroads and reenergize the country generally. By both instinct and logic this monumental exposition of the world's program seems to be justifiable.

But what achievements have we to celebrate? Without doubt the outstanding progress of the past century has been in science and its applications to human welfare. It is true that art, literature, religion, philosophy, business and politics have also changed, but these changes have been of a smaller order of magnitude and have for the most part been simply the reflection of the increasing knowledge of science and the development of its applications.

So it is eminently appropriate that this Exposition should be a monument to the achievements in science, and that these great scientific and engineering congresses should meet here at this time, and that we as engineers should be here tonight.

III. Educational Significance

The exposition will have a far-reaching effect on education. Those of us who have specialized in science or practiced engineering have some understanding of what science has done to our life and

(*Continued on Page 19*)

Contribution Of Engineering To Progress

—a Review and Evaluation

Address Delivered Before Associated Societies at Chicago, June 28th, 1933

By Edward J. Mehren

AMERICA this week is witness to a situation which many may consider paradoxic and which is at least dramatic.

On Chicago's Lake Front lies a great World's Fair—from beginning to end a glorification of the scientist and the engineer, an exposition of the physical achievement of the machine age.

To it this week have come America's engineers. But while they look and appraise, while they acclaim and are acclaimed, the world declares that the machine age they have created has failed and is responsible for our present economic and social debacle. "You have contributed to man's leisure, comfort and convenience," add the challengers, "but the results have been mental flabbiness and weakened morality. There has been no true progress." Such are the charges thrown at the work of the engineer in the very week that he gathers here at the great Fair.

This, then, the drama that America witnesses: it sees him face to face with his handiwork; it asks what answer he will make, for if his work has failed, so has he.

Here then the challenge must be met; never was the time more opportune.

Has engineering contributed to progress?

Has there *truly* been a century of progress?

Depression Gives Point to Inquiry

But there is another reason for facing the charge. Even were our social and economic systems intact and orderly, the meeting of these societies at such an exposition would demand a discussion of this kind. The machine age has been consistently under challenge for a score of years and more particularly since the close of the World War. Its effect and impact need inquiry, for engineering is now the basis of our economic system, it determines our social order, it goes down into the life of every individual and affects him for weal or for woe.

The present depression, therefore, does not dictate the topic. It *does* make it more pointed and more pertinent.

The Vicissitudes of Progress

When we speak of progress we mean movement or development in a desirable direction. I conceive that humanity is traveling a long road whose desirable direction and goal are the happiness of all mankind, accompanied, first, by a wide diffusion of this world's goods; second, by the highest order of intellectual development of which individual men are severally capable, and third, by high moral attainment, which may be expressed as that "peace with God and peace with ourselves that surpasseth all understanding." This is the goal, this the ideal.

Let us note that the goal of humanity at large cannot be defined solely in terms of happiness. Happiness is contentment with one's condition. The anchorite on the desert, with no family to care for, with few wants, sunk in contemplation and service of his Maker, was happy. So are the tribes of the South Seas. But neither condition can be the ideal for the race as a whole. The one is an unsocial life; the other, untouched by intellectual fire. Therefore, while some may stop by the wayside and be content with their lot, the race must go on to a higher common destiny, and that destiny includes not only happiness but social development and spiritual achievement.

But the long road that mankind is traveling is cut by ravines and chasms, some shallow, some deep and precipitous. The ravines and chasms are greed, exploitation, oppression, war, hunger and famine, insanitary surroundings, disease, ignorance, vice—and all those other hindrances which interfere with man's progress. At the beginning of recorded history, humanity toiled down into each of the chasms, forded the streams, and toiled up the opposing banks. Progress was slow.

In time, advancement of the arts, better social organization, education and religion, built bridges across the streams, at first only high enough to clear the flood. Further advances raised the bridges to higher levels, made them safer against floods, and reduced both the descent and the upward climb. Could the job ever be completed, we would build a bridge over every chasm from every bank top to bank top. The chasms in effect would disappear and humanity would go forward joyously on a high road—a true *high* way—to its destiny.

In the past there have been floods in the chasms, and the bridges, often high ones, have been swept away. War, pestilence, the incursions of barbarians, a recrudescence of ignorance, the twilight of religion, the re-triumph of greed—have thundered down the canyons and all but wiped out the achievements of the past. Painfully, humanity has had to start all over in building, in raising its bridges, in its conquest of the chasms.

Using the simile of the road, our questions can be paraphrased in this way:

"Has engineering helped to build bridges over the chasms, has it raised them to higher levels, has it made them more secure, has it brought nearer that high road without dips, on which humanity

(*Continued on Page 21*)

General News And Comments

Informative Items

ENGINEERS TO COMBAT UNFAIR PRACTICES

D. B. Steinman, Chairman of United Front Committee

At a recent meeting, attended by representatives of the principal engineering groups in the Metropolitan Area, a United Front Committee, with Dr. D. B. Steinman as Chairman, was formed for the purpose of combatting practices and policies discriminatory to the engineer.

The Committee forwarded the following communication to the several national societies below listed:

"The continued growth, over a period of several years, of policies and practices, corporate and governmental, which under the protecting cloak of economy and budget balancing are developing into abuses that threaten to reduce the engineer to a level rejected by organized labor, calls for concerted measures if the morale and integrity of the profession is to be maintained.

"While it is unquestionably true that discharging employees and reducing salaries have in most instances been compelled by conditions which are nation-wide in case and in scope, they have in many cases, especially those pertaining to engineers in the public service, been accompanied or followed by policies which suggest such exploitation of misfortune as is universally condemned by society.

"A few examples of the practices complained of are:

"Discharging permanent, experienced, civil service engineering employees of long service and allotting to emergency employees, at salaries as low as forty cents an hour, work that should be performed by the said regular employees.

"Requiring engineers, who after many years have attained positions of responsibility, to accept reductions as high as 50% in pay and several grades in rank, whilst still performing the same duties.

"Compelling engineering employees, under the threat of dismissal, to waive civil service and pension rights, for which latter they have contributed.

"Discharging in great numbers engineering employees in State, County and Municipal employ whilst retaining other employees for whose services there exists far less need than for those of engineers.

"These practices are entirely incompatible with appeals from those in high public office, who are constantly calling upon private industry to retain employees and increase wages. Surely non-governmental organizations can

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NATIONAL COUNCIL OF STATE BOARDS OF ENGINEERING EXAMINERS

Report of 1933 Annual Convention

The Fourteenth Annual Meeting of the National Council of State Boards of Engineering Examiners, held in Chicago during Engineering Week, June 26-27, 1933, was an outstanding event in the history of the organization, both in attendance and constructive work accomplished.

The officers of this Convention were as follows: President, O. Laurgaard, of Portland, Oregon; Vice-President, A. B. Clemens, of Scranton, Pa.; Secretary-Treasurer, T. Keith Legaré, of Columbia, S. C.

(It is of interest to note that the First Meeting of the National Council was held in Chicago November 8th 1920). Official delegates of 20 of the 25 Member Boards were present at the 1933 meeting, and 4 other States not members of the Council also had representatives present, making a total of 24 States represented.

Complete reports were submitted by the following committees: Accredited Engineering Schools, Uniform Examinations for Registration, Legal, National Bureau of Engineering Registration, Engineers' Council for Professional Development, Constitution and By-Laws.

The Secretary's report included the interesting information that 15 States now have pending laws for engineering registration. During the Convention of the Council notification was received that the Governor of Ohio had approved, on June 27, 1933, an Engineering Registration Law for that State, which was based on the Model Law drafted by National Engineering societies including the National Council of State Boards of Engineering Examiners.

The next Annual Meeting of the National Council will be held in Portland, Oregon, in October, 1934.

The following officers and board of directors were elected for the ensuing year:

Officers and Board of Directors: President, Prof. N. W. Dougherty, University of Tennessee, Knoxville, Tenn.; Vice-President, Ralph J. Reed, Los Angeles, Calif.; Past President, O. Laurgaard, Portland, Oregon; Director Western Zone, Dean G. M. Butler, Tucson, Ariz.; Director Central Zone, Jas. L. Ferebee, Milwaukee, Wis.; Director Northeastern Zone, Dr. D. B. Steinman, New York City; Director Southern Zone, Jas. R. Rhyne, Little Rock, Ark.; Executive Secretary, T. Keith Legaré, Columbia, S. C.

The National Council approved the charter of the Engineers' Council for Professional Development, of which it is a participating body, and appointed the following delegates to this conference of Engineering Societies:

Delegates to Engineers' Council for Professional Development: Dr. D. B. Steinman, Dean P. H. Daggett, T. Keith Legaré.

(To be Continued Next Issue)

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THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Nominations For Officers

Nominations for officers of The American Society of Mechanical Engineers for 1934 were announced at a recent meeting of the Nominating Committee held at Chicago, Ill., during the Semi-Annual Meeting. Election will be held by letter ballot of the entire membership, closing on September 26, 1933.

The nominees as presented by the Regular Nominating Committee of the Society are:

President, Paul Doty, Chairman of the Board, Minnesota State Board of Registration, St. Paul, Minn.; *Vice-Presidents*, H. L. Doolittle, Designing Engineer, Southern California Edison Company, Los Angeles, California; William L. Batt, President, S K F Industries, Inc., 40 East 34th Street, New York, N. Y.; Ely C. Hutchinson, President, Edge Moor Iron Company, Edge Moor, Delaware; Elliott H. Whitlock, Cleveland, Ohio, (Formerly Research Professor, Mechanical Engineering Stevens Inst. of Tech., Hoboken, N. J.); *Managers*, James M. Todd, Consulting Engineer, New Orleans, La.; Ernest L. Ohle, Professor Mechanical Engineering, Washington University, St. Louis, Mo.; James A. Hall, Professor Mechanical Engineering, Brown University, Providence, R. I.

* * *

OHIO ADOPTS REGISTRATION ACT

Governor White Approves Legislation

On June 27th last a measure sponsored by Senator Waldvogel, at the instigation of the Ohio Engineering Society and the several civil engineering groups of the Buck Eye State became law with the signature of the Governor of that Commonwealth.

The Act, which becomes effective January 1st, 1934, resembles very closely the Uniform Registration Act prepared by the several national engineering and other groups at the suggestion of the American Society of Civil Engineering.

Congratulations, Ohio. It is but a matter of time until every state appreciates the necessity for safeguarding the public well being by regulating the practice of engineering.

* * *

A. L. BROCKWAY DIES

Long Member of N. Y. State Architects Board

On June 24th, Mr. A. L. Brockway, of Syracuse, a member of the New York State Examing Board for the Registration of Architects, and prom-

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EXAMINATION QUESTIONS

For License To Practice Engineering

New York—January 30th to February 2nd, 1933

Part II
CIVIL ENGINEERING (First half)
Thursday, February 2, 1933—9:15 a. m. to 12:15 p. m., only

Answer any five of the following questions. Slide rule and any reference books may be used. Return these questions with your answer papers.

Return at 1:15 p. m. for the second half of this examination.

1 *a* Sketch a retaining wall showing the angle of repose of earth.

b Show the line bounding the prism of maximum pressure.

c Show the relation of the vertical angles bounded by the line of repose, the line of maximum thrust and the wall.

d Draw the diagram of forces acting upon the wall and show the position the resultant must take in order to insure stability.

2 A sewer 700 feet long with a fall of 2.1 feet must carry 9.5 cubic feet per second when full. What size of circular vitrified-pipe sewer is required? What will be the velocity of flow? What coefficient (*n*) should be used in the Kutter formula?

3 It is planned to locate a reservoir dam across a given part of a valley, the final location to be determined. What geologic investigations are called for?

4 It is desired to supply a total of 1500 horsepower of electrical energy to certain motors by a hydroelectric plant. If the turbine efficiency is 81%, the generator efficiency 92% and the loss in transmission 3%, find the quantity of water necessary with a head of 75 feet.

5 A weir with end contractions is 8 feet long and the measured head is 1.5 feet. Calculate the discharge on the assumption that the velocity of approach is negligible.

6 Describe the activated sludge process for treating sewage and discuss the results obtained.

7 Describe in full *one* method accepted as good practice for waterproofing a concrete wall 20 feet high constructed in wet ground.

8 Determine the size of a storm sewer to drain an area of 10 acres having an impervious factor of 0.2. [Assume rate of rainfall and other data necessary.]

9 To what extent shall distance and curvature in the location of a state highway be made use of to avoid grade?

10 Given a heavily traveled state highway of 30-foot width or greater, state *the order of importance* of the following in its location and construction and give reasons for your answer: (*a*) grade, (*b*) alignment, (*c*) grading cost, (*d*) vertical sight distance, (*e*) drainage.

Part II
CIVIL ENGINEERING (Second half)
Thursday, February 2, 1933—1:15 to 4:15 p. m., only

Answer any five of the following questions. Slide rule and any reference books may be used. Return these questions with your answer papers.

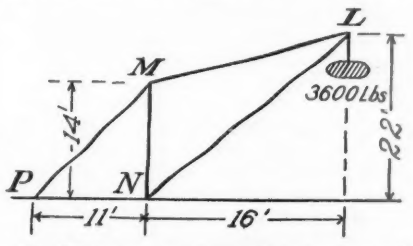
11 A pile was driven with an ordinary drop hammer weighing 2600 pounds. The sinking under the last six blows was 18 inches. The fall of the hammer during the last blows averaged 25 feet. What was the safe bearing power of the pile?

12 It is desired to raise 25 cubic feet of water per second by pumping to a tank 400 feet above and 12,000 feet distant from the pumping well. Find the horsepower necessary to do this work through a main 30 inches in diameter, having six bends, assuming a value of 0.018 for the coefficient of resistance due to friction, a value of 0.5 for the coefficient of resistance at entrance, and the value of the coefficient for each bend as 0.9.

13 Discuss fully the following general methods of determining the resistance moment of a plate girder: (*a*) moment of inertia method, (*b*) chord stress method.

14 Define the following: (*a*) ratio of slenderness, (*b*) bending moment, (*c*) longitudinal shear, (*d*) section modulus, (*e*) radius of gyration.

15 A concrete pavement slab 20 feet wide and 7 inches thick has a doweled center joint with bars spaced 5 feet apart. Assuming a coefficient of friction with the subgrade of 1.0, a working stress in the steel of 16,000 pounds per square inch, and a bond stress of 80 pounds per square inch, find the proper size and length of dowel bar.



16 The crane truss shown above is loaded with 3600 pounds at *L*. Determine the stresses in the boom *LN*, the tie *LM*, the mast *MN* and the stay *MP*.

17 Give and discuss *two* methods of handling quicksand in construction work.

18 The water behind a dam is 25 feet deep. Determine what the total pressure will be per foot of length of the dam; find also the moment tending to overturn it.

19 How many cubic feet of water per second will be discharged by a canal 125 feet wide at the water surface, 75 feet wide at the bottom, 10 feet deep and 2640 feet long, with a fall of 40 feet? [Take C = 88]

20 State and discuss briefly the successive steps necessary to secure information regarding the availability of a watershed for purposes of potable water supply.

Part II
MECHANICAL ENGINEERING
(First half)
Thursday, February 2, 1933—9:15 a. m. to 12:15 p. m., only

Answer any five of the following questions. Slide rule and any reference books may be used. Return these questions with your answer papers.

Return at 1:15 p. m. for the second half of this examination.

1 *a* Compare briefly the characteristics and proper power applications of four-cycle and two-cycle engines.

b A four-cylinder, four-cycle, single-acting, stationary Diesel engine runs at 600 r. p. m. The m. e. p. is 120 pounds to the square inch. Cylinder dimensions are 8½" bore and 11" stroke. The mechanical efficiency is 80%. Determine the horsepower and show plainly how you get your answer. Correct method is more important than precision of result.

2 What are the effects on power cost, other factors being right, of increased steam pressure and of superheat? How would you determine the degree of superheat, if any?

3 A cam operates upon a 1" diameter roller. The roller is on a lever 3" from its fulcrum. It is required to move uniformly the opposite end of the lever 7½" from the fulcrum though 5" of travel. This movement is to be effected during one-half revolution of the cam. There is then to be a dwell during one-sixth revolution, after which the lever is to be uniformly returned to its first position. By a free-hand sketch, or otherwise, as you prefer, show method of laying out the cam. Method of solution, not accuracy, is required.

4 Name in cycle order the principal pieces of apparatus in an ammonia compression refrigeration cycle.

5 *a* What is an "articulated locomotive"? Where and for what would it be used? Why?

b What is the "tractive force" of a locomotive? What factors are used in its calculation?

c What is the relation of "tractive force" to "draw bar pull"?

6 List in approximate order the operations involved in machining and finishing automobile cylinder blocks cast integrally with the top half of the crank case.

7 What inspection precautions would you take to insure the changing of elevator cables before they became weakened and dangerous through use? What are the effects of use that you desire to guard against?

8 One hundred twenty-five horsepower is to be transmitted between two shafts, one foot between centers, the driving shaft turning at 2500 r. p. m. and the reduction being 2 to 1. Designate the proper material for gears and sketch your design, indicating the diameter, face, pitch and type

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NEW YORK NEWS AND ACTIVITIES

T. Hayden Hamilton, Associate Editor

Chapter News

RAPHAEL J. SMYTH

Chairman of Committee on Chapter Activities

NASSAU COUNTY

A meeting of the Nassau County County Chapter was held at the Bar Association Building in Mineola on June 1st.

The Chapter registered a formal protest against the practice inaugurated by the Emergency Relief Bureau of New York City of appointing men without engineering qualifications as "Assistant Engineers" on emergency relief work and instructed the Secretary of the Chapter to advise Hon. Frank J. Taylor, Chairman of the Relief Bureau, of the Chapter's deprecation of that practice. This action was taken in response to a notification which had been sent by Westchester County Chapter to the other Chapters in the Metropolitan District apprising them of the reprehensible practice with its degrading effect upon the profession and urging collective defensive opposition to its continuance. Following the receipt of this notification a number of Chapters, like Nassau, registered their disapproval. The merit of these protests was acknowledge by the Emergency Relief Bureau and the inappropriately designated "Assistant Engineers" have been redesignated as "Foremen" or given some other title more accurately descriptive of the positions they are filling. Credit is due to the members of the Emergency Relief Bureau for their prompt rectification of an unfortunate condition and congratulations are extended to those Chapters to whose vigilance and vigorously defensive action the happy conclusion of the incident is attributable.

The recent gathering of the members of Nassau and Suffolk County Chapters was so successful and pleasurable that "its memory lingers on" so intriguingly that Mr. John R. P. Goller, Chairman of the Chapter Activities Committee, states in his report of the Chapter meeting that his Committee "is planning to keep in touch with the Suffolk County Chapter with the intention of repeating the delightful joint meeting held in Huntington, in May."

Mr. Arthur G. Archibald, Secretary of the Chapter, was elected to the office of the Vice-Presidency, which was vacated by the death of Mr. George Scofield Vander Werken.

The Chapter is desirous of having the State Society adopt an emblem and the Secretary of the Chapter has been instructed to advise the Executive Board of the State Society of its desire. In this connection it is recalled that in 1931 the referendum of the question of the adoption of an emblem to the membership of the State Society resulted in 238 votes being cast in favor of adoption and 135 votes being recorded in opposition. Action on the matter was temporarily suspended as it was considered that the then continually falling economic barometer indicated that conditions were unpropitious for enterprises which would require additional financial expenditures by members of the Society. However, the present "rising barometer" foretells fair economic weather and when "happy days are here again"—which we all pray will be soon—an emblem will be adopted and made available for the many Engineers who desire to exhibit this outward sign of their affiliation with the Society which, during its short life, has so remarkably elevated the status of the Engineering Profession in the Empire State.

* * *

ULSTER COUNTY

Mr. Edward P. Ward, Secretary-Treasurer of the Ulster County Chapter, has submitted the following interesting report of the last meeting which was held by the Chapter on April 25th in the Crystal Dining Room of the Governor Clinton Hotel in Kingston. It is reported that "Chick" Gross was the host of the Chapter and its guests at a most delectable dinner which was served previous to the business meeting.

Mr. Francis X. Bode—the distinguished Chapter organizer of Albany County Chapter— who was introduced by Mr. G. W. Codwise, the President of the Chapter, gave a brief but very interesting recital of the work which has been accomplished, and is being accomplished, by the State Society.

The principal guest-speaker was Mr. Roy G. Finch, former State Engineer, who is at present Secretary of the State Board of Examiners of Professional Engineers and Land Surveyors of New York State. He discussed the professional problems of the Engineer and the necessity for his protection by a comprehensive and effective licensing law. He outlined the progress which is being made by the various States in the adoption of reciprocal agreements governing the admission of Licensed Engineers to practice in those States which have entered into such agreements. He also described the accomplishments of the National Association of State Licensing Boards in its work of establishing a uniform licensing law embodying common standards of qualifications for licenses. Having risen from the lowest grade in the Competitive Engineering Service of the State to the position of State Engineer—the foremost Engineering position in the State— and having been identified with the activities of the State Licensing Board for many years, Mr. Finch has, by experience and association, acquired an exceptionally keen understanding of the problems and needs of the Profession and his discourse before the Ulster County Chapter will long be remembered by those who had the good fortune of being members of his audience.

A brief speech was delivered by the oldest member of the Chapter, Mr. David Merritt, who recounted a few of his interesting experiences during his long period of service which runs back to 1869. It is the belief of the members of Ulster Chapter that he is the Dean of Surveyors of New York State and it is their hope that they will be privileged to honor him as such for many years.

Mr. James F. Loughran, a member of the Chapter, exhibited several moving pictures taken by him in connection with work done under his jurisdiction as the Superintendent of Highways of Ulster County. These illustrated the latest methods of macadam road construction, snow removal and quarrying. Some excellent views of the famous and picturesque Catskill Mountains taken from vantage points along the County highways were shown. In addition, some fine shots of recent overflows at the Ashokan and Gilboa Dam spillways were thrown upon the screen.

Mr. Ward observes that "for some inexplicable reason our experience is that the best attended meetings are those which are accompanied by food, but we are of the opinion that this was not the only attractive feature of our April get-together." Why anyone should need refreshment (food or liquid) in addition to the admirable program outlined above, to attract him to a meeting such as is reported, is mystifying. However, Mr. Ward is profiting by his own peculiar experience and is evidently planning for a "bigger and better" meeting in the near future; he suggests somewhat cryptically that it is rumored "that the mystic number 3.2 will be on the program" of the next meeting. If the rumor is substantiated the coming meeting will surely be a record-breaker for attendance.

* * *

KINGS COUNTY

Mr. Roy C. Cram, Secretary of the Kings County Chapter, has reported that the last Chapter meeting of the 1932-33 season was held on June 1st at the Brooklyn Engineers' Club.

In the enforced absence of the President of the Chapter, Mr. Linford S. Stiles, and of the Vice-President, Dr. Ehrich Hausmann, the meeting elected as Temporary Chairman, Professor John C. Riedel, whose manifold experiences in presidential offices of Engineering associations have made him a past-master of parliamentary law and organization procedure.

Comment was made upon the facts that 9,500 licensees were listed in the 1932 State Department of Education Roster of Professional Engineers and Land Surveyors and that License Numbers of current issue are around 12,-500. The fate of the 3,000 to whom licenses had been granted aroused much speculative thought. And as it is possible that some of this number are practicing illegally under

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NEW JERSEY NEWS AND ACTIVITIES

Gerald W. Knight, Associate Editor

EDITORIAL COMMENT
By Vincent J. Scanlan

THE SECOND PANIC IS STILL ON

While millions of idle hands yearn for honest work and while the resources of the country and this section remain scarcely scratched, the persistent beat of propaganda continues. On the air, in the public press, in allegedly intelligent publications it continues. Legislators, executives, public officials and more regrettably, many engineers yield to the persistent demand for less improvements.

The governmental agencies of this country are not perfect. Their strongest proponents concede this, but under them this nation and the towns and cities thereof have advanced with a rapidity and to a degree never approached in the annals of time by any nation or any form of society. Yet government today is accused of everything and anything up to being the sole cause of the present economic condition.

Of course expenses can be reduced and the services given by municipal governments for ten to fifteen cents a day abandoned. Why the schools? Teach the child at home and save a few cents. Why the policeman? Buy a gun and protect your own home and your loved ones. Let a fire extinguisher replace the municipal department. Sewage can again flow down the gutter and water may still be available at the old well. The corner gas light is easier on the eyes and if pavements were no longer laid automobile noises might decrease.

Maybe public officials bought too much but certainly most of the things purchased were enduring and useful and with all the hue and cry no one suggests that the city sell its holdings to private corporations. Can it be in the light of facts that our cities are after all best fitted for supplying such services? If not, there's work to be done. If so, there is still work to be done.

N. J. LEGISLATIVE HIGHLIGHTS

Senator Wolber has introduced a bill designed to facilitate consolidation of municipalities. It provides for the appointment of a state commission to be supplemented by county commissions empowered to submit recommendations to the state commission before the next session of the legislature. It is believed that this method, an impartial state body acting upon local studies, will do much to relieve the many bickerings, dickerings and petty jealousies so often attendant upon legislative matters of this type.

A "model" county planning act, sponsored by the N. J. State League of Municipalities and the Regional Plan Association, awaits action at this writing although key men indicate their belief in its passage.

Bills to enable the state to set up self liquidating sewerage and related systems sponsored by the New Jersey Association of Professional Engineers and Land Surveyors and drawn by Richard H. Lowe, the Association's counsel, remain without final approval.

Bills concerning the continuance of the Tri State Treaty Commission for the Abatement of Pollution in New York Harbor seem likely to go back to committee for revision.

These and many similar measures are of immense importance to the engineer and it is regrettable that his influence is not more strongly felt. ACTION is needed.

* * *

REPORT OF RADIO ACTIVITY

It is customary with every issue of the American Engineer to inform the readers of the progress which the New Jersey Association has made with its radio broadcasting activity. It has been most fortunate in securing public addresses by many engineers prominent in their fields and in government; that this has been received by the public at large with interest is apparent from the numerous comments which have been received. These weekly addresses, however, are but a small part of the radio campaign to bring the Engineer into the public's view. Our great opportunity comes in September of this year when over Station WABC and seventy-six affiliated stations of the Columbia Network the Association will inaugurate something both novel and valuable. A series of ten episodes will be given, one each week, dealing with important engineering achievements. The title of the series is the "Romance of Engineering," and the entire project has been dedicated to the heroes of peace, the Engineers of the world.

It is high time that the Engineer be removed from his oblivion and placed on the pedestal which he rightfully should occupy. Why should the people of the world be taught that the Emperor Hadrian built a viaduct for the pure water supply for the City of Athens when, as a matter of fact, it was built by engineers whose names are unknown. Why should the school children be taught to deify the warlike heroes of history, but receive no knowledge of the great parts played by the Engineers and Scientists of the world. Should they not be told more about Pasteur, De Lessepps, Goethals and the like and less about Alexander the Great, Napoleon and Gengis Khan. Why should their era disappear with them and become a legend.

It is our duty, as Engineers, to familiarize the general public with this vastly important part which the Engineer has played in our present civilization and which he must continue to play if we are to exist and to progress. We can not, as the vintners of France have done, appropriate some hundreds of thousands of dollars for the purpose of educating the American public in the use of wines, but we can earnestly and conscientiously give our time and our intelligence to the end that we may see the Engineer of today and of the future properly recognized.

Our great opportunity today lies in the presentation of these dramatized episodes relating to engineering achievements. To be of value educationally, they must be technically correct. To be interesting to the lay public, they must have human interest, and to intrigue the youth of this country, there must be an aura of romance.

Every member of the engineering profession can help. He can assist his chapter committee in the compilation of materials, and those who are qualified in voice, diction and enunciation can fill positions in the cast which will present dramatized episodes over the air, starting in September. You owe it to your profession to assist in this work and who better than yourselves can tell the public at large what the Engineer stands for.

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RADIO ACTIVITIES

A NOTICE

The present radio season of the New Jersey Association of Professional Engineers and Land Surveyors approaches its close and there are now only a few remaining programs left to go on the air.

Station WAAM, Thursdays, 2:30 P. M.

July 13th—Morgan F. Larson—Back to Work.

Station WINS (New York American), Fridays, 8:15 P. M.

July 14th—George R. Merrill—The Fetish of Tax Reduction.

July 21st—Robert L. Hatfield—The Machine and the Operator are One.

The State Radio Committee feels that it has made a good start towards accomplishing the aims for which these programs were inaugurated. It believes that in bringing to public attention those engineering problems which directly affect the communities and counties of the state it is fulfilling the first requisite of good citizenship. The broad field of subjects covered this year, presented by men who are leaders in their fields, has certainly proved of great value to the citizens of the state and the results accomplished have been worth the effort.

Plans for next year are already being formulated and the schedule at present allows for one individual speaker to present a 15 minute address over a prominent metropolitan station for 52 weeks at a regular hour each week. The talks will cover a definitely laid out program for the year and it is the anticipation of the committee that the necessary material for the speaker's use will be solicited from Association members.

The Radio Committee desires to thank all of those who have in any way given their time and participated

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Chicago Plays Host to the Engineer

(Continued from Page 5)

an Annual Convention of Professional Engineers? Such would pave the way for the formation of an "American Academy of Engineering."

The fifteen organizations which participated in the program for "Engineers' Day" were: American Society of Civil Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers, American Institute of Mining and Metallurgical Engineers, American Insititute of Radio Engineers, American Society of Industrial Engineers, American Society of Refrigerating Engineers, American Association of Engineers, American Association for the Advancement of Science, National Council of State Boards of Engineering Examiners, Society for the Promotion of Engineering Education, American Ceramic Society, American Foundrymen's Association, American Society for Testing Materials, Western Society of Engiiners. With such a nucleus a truly representative American Engineering Society, comprising many branches, but directed toward a common objective, —the welfare of human society,— could be effected without difficulty, if provincialism within the calling were subordinated to the welfare of the most necessary of all professions.

* * *

The Fiftieth Anniversary of the Brooklyn Bridge

(Continued from Page 6)

When he presented his plans for flinging a mighty span across the East River, he had to fight his way, inch by inch, against incredulity, ignorance and prejudice, before the right to try was given him.

There arose about him a chorus of protest. Engineers, more eminent than he, denounced his plan as visionary and impracticable. Officials and citizens joined in denunciation and discouragement. But Roebling remained steadfast in his convictions, and the men who had selected him loyally maintained their confidence.

The bridge company was authorized to raise $5,000,000 by stock subscriptions. The City of Brooklyn subscribed $3,000,000 the City of New York $1,500,000, and a few public-spirited citizens subscribed the remaining $500,000.

With sound judgment and prophetic vision of the future development of the two cities and their connecting bridges, Roebling selected the location of the span. Surveys and soundings were made. In the brief space of three months, Roebling prepared the plans for the monumental structure.

But the general public still remained skeptical. Even prominent men like Horace Greeley and Mayor Kalbfleisch of Brooklyn voiced their doubts of the feasibility of the venture. People were staggered by the great length of the proposed span, 50% greater than the longest span previously achieved. It was "a leap in the dark."

In order to set at rest the growing doubts and apprehensions of the public and to melt the frozen opposition of the skeptics, Roebling asked that a board of the most eminent engineers of the profession be invited to review his plans. This Board included competitors of Roebling and engineers who had previously severely criticized the design as unsound. The Board held many meetings at which Roebling ably defended the thoroughness of his design and its practicability. After two months of consideration, the Board of Consulting Engineers in May 1869 unanimously confirmed the feasibility, strength and durability of the proposed structure as planned and designed by Roebling.

At the same time, a commission of three Army engineers, appointed by the Secretary of War, was studying the plans for possible obstruction to navigation and for general feasibility of the project. They fixed the required under-clearance at 135 feet, which became the standard for future bridges over navigable water. In June 1869 the Secretary of War approved the plan and location of the bridge.

Professional opposition had been overcome, official approval had been secured, and public confidence had been won. The plans were accepted and approved, and construction was authorized to proceed.

The man of vision and courage had won. He had overcome all obstacles and had reached the point of seeing his project finally launched. But tragic fate stepped in and decreed that this man of genius and destiny should not behold the fulfillment of his dream. A week after the War Department approval was secured, Roebling was engaged in making surveys for the location of the main piers when a boat coming up the bulkhead caused his right foot to be crushed between the timbering. Three weeks later, on July 22, 1869, he died as a result of this injury.

John A. Roebling was 25 years old when he came to this country and 63 years old when he died. He had come to our shores as a poor immigrant youth, but he left the imprint of his genius to enrich our heritage.

The work that Roebling had so nobly begun called for a successor to carry it forward. By destiny or prevision, Roebling had prepared a deputy who was indeed a part of himself, his own son, Colonel Washington A. Roebling. This young but able engineer had been trained and prepared for this work, and he was promptly appointed to fill the place left vacant by his father's death.

Young Roebling had graduated as a Civil Engineer in 1857 from Rensselaer Polytechnic Institute, the first engineering school in this country. He fought in the Civil War, where he rose from a private to the rank of Colonel. His commanding officer pronounced him "ablest and bravest." He had worked with his father on the construction of other great spans and was thoroughly familiar with the plans for the new structure. In 1867 his father had sent him to Europe to study the newly invented method of sinking subaqueous foundations with the aid of compressed air, and he returned to Brooklyn only a few months before his father's death.

Young Roebling took up the work and carried it forward, loyally and courageously, but not without further vicissitudes and sacrifice. Contracts were let, the caissons were built and launched, and the sinking of the foundations proceeded. It was the first application of the pneumatic caisson method in this country, and many unprecedented difficulties had to be overcome. Man after man succumbed to caisson disease. Mindful of the critical nature of the operation, when any slip might mean disaster to the project, Col. Roebling spent nearly all of his time in the compressed air directing the work of his men. Day and night the work proceeded. The menace of fire, accelerated by the compressed air, was ever present. Before the days of electric lights, gas and candles were used for illumination. Repeatedly fires broke out in the timber caissons, and young Roebling fought heroically to save his father's dream from destruction. Hour after hour, he remained in the heart-crushing pressure of the subaqueous chamber, fighting the flames until the structure was saved. This superhuman devotion to the task ultimately took its toll. One day in the spring of 1872, he was carried out of the caisson, broken in body, a paralytic invalid for life.

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After the exercises, the President, the Governor, and the proud citizens of Brooklyn marched to Roebling's home to do honor to the man who had sacrificed himself to carry the project to its consummation.

When the Brooklyn Bridge was completed, it was heralded as "the Eighth Wonder of the World." It was indeed a triumph of the bridge builder's art.

The greatness of the achievement is emphasized by the fact that the science of bridge design was then in its infancy. The first crude theory of suspension bridge analysis did not appear until too late to influence the design of the Brooklyn Bridge. Nevertheless this bold span, designed by judgment and the intuition of genius, has been safely carrying, after a generation of service, three times the loading for which it was planned.

The stiffening trusses may be inadequate by modern computations and some day they can be replaced; but the essential parts of the structure— the towers, cables and anchorages— are good for centuries.

The Brooklyn Bridge is undoubtedly the most famous bridge in the world. Its picture is familiar even to the schoolchild in every country of the globe. It has become a part of the world's heritage.

John A. Roebling was one of those rare geniuses who come generations before their time. The Brooklyn Bridge, in form and pattern, in composition and proportion, is his creation. It was built as he conceived it. It is an artistic as well as an engineering masterpiece.

The pierced granite towers, the graceful arc of the main cables, the gossamer network of lighter cables, and the arched line of the roadway combine to produce a matchless composition, expressing the harmonious union of power and grace. It is a thing of enduring beauty.

The souls of men have poured into its creation.

CONCLUSION

The men who made the Brooklyn Bridge dreamed their dreams and wrought their dreams, giving health, strength, and even life itself as the price of achievement.

We today are profiting by the inspiration and the work of the pioneers, and are tackling even greater tasks.

We have received the torch of progress from the pioneers, and we must pass it on undimmed to the generations that follow.

We too must dream, and we must build our dreams into beautiful enduring reality. We must carry on in the noble faith of the master-builders of the past, and we must build as they have builded.

In the immortal words of Ruskin:

"Therefore when we build, let us think that we build forever. Let it not be for present delight, nor for present use alone. Let it be such work as our descendants will thank us for, and let us think, as we lay stone on stone, that a time is to come when those stones will be held sacred because our hands have touched them, and that men will say as they look upon the labor and wrought substance of them, 'See this our fathers did for us'."

Comment: Lack of space prevents publishing in full the splendid address of Dr. Steinman. Copies may be obtained from the author or the Editor.

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What a College of Engineering Should Train For

(Continued from Page 7)

possesses so that the world will benefit from it? The obvious first step is to discover, as far as possible, the special aptitudes and mental qualities of the boy. Perhaps this should be done during his high school period of training. In some cases perhaps his high school records would be some indication of his talents.

Granting, however, that the inadequacy of our high schools makes such data unreliable, it still is the responsibility of an engineering college to determine as far as possible the interests and mental qualifications of its students before they get through their sophomore year at the college. This can not be done by appointing youthful inexperienced advisors to the incoming students. There should be enough experienced engineering professors in the College so that each student during his freshman year could have the benefit of at least an hour's personal interview with one of these experienced men. After all, Industry is engaging graduates after an interview of less than an hour, on the average. It must judge their fitness for its work, so why can not the College similarly judge its incoming students? In general, it does not take Industry as much as a year to discover qualifications for a job, and if men are not qualified it probably does them a favor by firing them. Why can not an engineering college do likewise?

It would be fortunate indeed if the engineering student would come to college with his mind made up as to the branch of engineering he wanted to follow. In the rare cases in which this occurs, it is perfectly proper to ask the student to sign up on entrance to the college for some special branch of engineering. With the average incoming student, however, such a request seems futile. The student should have at least a year and preferably two years to find himself. Medical colleges do not require a student to specify on entrance whether he is going to specialize in the general practice of medicine, research medicine, laryngology, urology, gynecology or any one of the many specialties of the medical arts. Inasmuch as the first two years in the engineering college are substantially the same for all of the various branches of engineering, why ask the student to commit himself any further than to say that he wishes to study engineering.

Some of your new students probably never had a screw driver in their hands and are told by their parents to study some branch of engineering. If these boys were discovered in their first year and convinced that they should transfer to another department, a good many future headaches and heartaches might be avoided. I know of a lad of very superior intelligence who, because his father was a successful engineer, was practically forced to take an engineering course, for which he had no inclination whatsoever. He reached his Junior year with good grades because of his superior mind, but surprised his friends by telling them that he thought his College course a waste of time. Shortly afterward he suffered a bad nervous breakdown. After graduation he stayed away from the engineering profession, choosing merchandising as the nearest thing to his liking. One can not help feeling that a short interview with one of the mature professors and possibly of the latter with the father, might have rescued a superior mind for application to life endeavor useful to the boy and to society.

To return once more to the fundamentals of engineering training, cultivation of ability in design is of great importance and this, of course, can be accomplished in well taught courses in Descriptive Geometry and machine and structural design. The ability to think and to visualize clearly in three dimensions is often deficient in our engineering graduates. Occasionally one sees a shop mechanic without a college education, because of his ability to visualize a structure in relation to its function, solve a problem that has stopped the college trained engineer. This ability may come from experience which the limited time of a college course can not give, but it should be given enough emphasis so that the engineer will acquire it in his professional life.

An important department in which an engineer's training is now woefully deficient is the English language. One reads of experiments by psychologists which indicate that engineers along with representatives of a few other professions, head the list in intelligence tests. Superior intelligence in a group of engineering subjects, usually means at least good intelligence in other subjects. If this is true, there is no reason why the engineer should not be master of the English language. The only thing which prevents this is an unfortunate tradition which exists among the students in our colleges of engineering, that an engineer must be a rugged he-man with a contempt for culture and the best use of the English language. One does not understand why our engineering teachers can not dispel this idea. Anyone who has read Henriside's Electrical Papers can not help admiring his beautiful literary style, which is superior to that of many men of letters. There have been other engineers, such as Kelvin, who had the ability to write their ideas in the clearest and most pleasing English as well as to crystallize them in the most precise mathematics. Perhaps the School of Engineering should delegate some one to select the writings of great engineers noted for their mastery of English, and use these as the basis of a course in English, for Engineers. This would accomplish two things. First, it would show to the student that the careers of the great engineers whom he wishes to emulate were not characterized by a "roughneck" use of English. Secondly, it would stimulate his interest in and teach him the use of English in his profession, since it would show him how well his great predecessors in the profession had mastered it.

What special training, if any, is required to qualify for a career in so-called executive engineering? Perhaps the broadest object of executive engineering is to introduce the work of the creative engineer to our industries and most important, to see that proper use is made of it. This involves also a good understanding of the fundamental sciences specified above for the training of an engineer.

The executive engineer must know enough fundamental science and engineering not to lead his industry into an unsound engineering proposition. After satisfying himself as to the engineering soundness of the proposed undertaking, he must be able to present it to his board of directors in the clearest possible English. Boards of directors do not understand mathematical expositions, no matter how beautiful and complete they may sound to the engineer. Hence the double importance of a mastery of English to the executive engineer.

Along with the ability to express himself clearly, the executive engineer should possess the necessary strategy in handling people. Perhaps courses in psychology and in public speaking could be helpful. In addition to these qualifications, the executive engineer should have a training in the fundamentals of economics. More engineers are needed to help govern our present erratic economic system.

If there can, in addition, be discovered in him an intuitive anticipation for the public acceptance of an engineering improvement, he is especially favored for following an executive career because most of his undertakings will prove money makers. This intuitive appreciation of the usefulness and public acceptance of engineering improvements is to the executive engineer what the intuitive appreciation of natural truths is to the creative engineer. When combined in a single man, these quali-

ties produce an Edison or a Westinghouse.

To summarize, the opinions herein set forth are:-

1. An Engineering College can not hope to train men specially for even a small proportion of the great diversity of engineering industries he will confront on graduation.

2. A major problem of the Engineering College is to select men with potential engineering talent, and to definitely discourage those who are not inclined toward engineering except through outside influence.

3. Training and development of the student in the basic natural sciences of physics and chemistry is of first importance.

4. Mathematics in its abstract theoretical sense is not essential to an engineering training. This subject is important in an engineering training only insofar as it is taught in combination with the natural sciences and engineering subjects.

5. The college must do away with the unfortunate tradition that an engineer speaks English like a "rough neck" and holds in contempt the cultural accomplishments of life. Teach him to emulate the successful cultured engineers of the past.

6. The executive or sales engineer must also have good fundamental knowledge of science and engineering.

7. The intuitive anticipation of the usefulness and public acceptance of an engineering improvement is as important to the executive and sales engineer as is the intuitive perception of natural truth to the creative or research engineer.

Note:—The American Engineer expresses appreciation of the courtesy of the Milwaukee Engineer with whose approval the above article has been published.

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To Stabilize or Not to Stabilize?

(Continued from Page 8)

was thought to have had magical qualities, and when it was first used as money, it was considered to be a desirable, valuable commodity that everyone would want and be glad to possess. The fact that it fluctuated in its value, as related to other things that men wanted, while realized by a few, was perhaps not generally appreciated. It is only in modern times that a few economists have brought out the unfairness of any financial system based on an unstable standard or measure of value.

People in the future should be assured that the money they borrow and owe, in order to run their farm, transact their business, or operate their grocery store, as well as the taxes they have to pay, or the rent they have obligated themselves for by their leases, can be paid in dollars, that will be honest dollars and that will bear some close relation in value and purchasing power to things they produce, manufacture, or sell. If this is not so, the dollar is not an honest dollar. It is not a stable measure of value.

As time goes on and we pull out of this depression and look back on it, we shall conclude that one of the reasons for it was the instability of our financial system, and that we as a nation stubbornly held on too long to our fetish of a gold standard. This was really the only nation which—up to March 4th—adhered to the gold standard. France is supposed to be still on it, but since the war, she has cut down the gold content of her franc, so that it is now only worth 1/5 of its original worth. Germany, in spite of her reichmark, during the same time entirely wiped out all internal obligations and debts, by inflating her old mark to the vanishing point. Others have resorted to various devices and subterfuges so that they were not really and honestly on the gold standard.

The condition that obtained up to March 4th, when we actually went off the gold standard, was very much the same as if groups of men, representing all the nations of the world, had at one time met and created a standard of measure, namely a yard which was to be 36 inches long, and each one obtained a stave or stick 36 inches long, which he took home, understanding that thereafter when a yard was called for it was to be of a length represented by the stick. As time passed on, one of the men thought it would be a good idea to break off a few inches of his stick so that when someone else bought 100 yards of something from him he could get away with delivering something less, claiming that he was honest because it was 100 yards in accordance with his measure. Others finding out about it proceeded to break pieces off their sticks and the sticks became shorter and shorter. One man, representing our United States, stubbornly stuck to maintaining his stick 36 inches long. One can understand what was happening to that poor misguided honest man, yet that is exactly what the United States tried to do until March 4th.

Since then we have been breaking off pieces of our stick. The other felhope to get us to stabilize before we break down the length of our stick so that it will be of nearly equal length with theirs. They are sorry we started to break at all, in other words, go off the gold standard, and they hope to get us to stabilize before we get down to an honest measure of value comparable with the measure they use.

Do Americans think that we should stabilize before we get back to the terms of our original agreement of measure or value? The writer does not believe that the President of the United States thinks so. He is too keen and has too clear an understanding of international relationships and of fundamental principles.

When nations get through juggling and each one is on to the other's game, when there is no further advantage to any nation in adjusting its money value so as to exploit some other country, we shall all meet again and agree to re-establishing the 36 inch yard stick, and then we shall all go back on the gold standard.

The time will come, and perhaps this business catastrophe of ours will have its silver lining and hasten this time, when we shall have an honest dollar, an honest sterling, an honest franc and an honest mark, and when it arrives our civilization will look upon past financial history and the so-called gold standard as a clear indication that we were not thoroughly civilized—we were still barbaric.

No one can prophesy whether that future honest dollar will be a gold dollar, or a dollar based on something like Professor Fisher's commodity index. In any event, let us stabilize, and the sooner the better. But do not let us stabilize a fluctuating gold value, but rather stabilize our money standard—our dollar—on the basis of a fair, uniform purchasing power for it, which will be agreed to and honestly maintained by all other nations We must stop the stick breaking practice. The Engineer, perhaps better than any other, appreciates that false assumptions are incompatible with honest accomplishments, and that false values cannot be maintained without consequent disaster to society.

Comment: The above is a nation-wide radio address delivered June 29th and July 1st for the American Legion over Columbia and National network, respectively.

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A Century of Civil Engineering in the United States

(Continued from Page 9)

Civil Engineer has accomplished, and we shall endeavor to do this with pride but also without laudatory phrasing.

Civil Engineering was defined by Thomas Tredgold in 1828 as the "Art of directing the great sources of power in nature for the use and convenience of man."

Engineering was formerly divided into Military Engineering, which is the art of designing and constructing offensive and defensive works, and Civil Engineering, in a broad sense, as relating to other kinds of public works, machinery, etc.; so that in modern usage Civil Engineering is the art of planning, laying out, constructing public and private works, such as railroads, highways, canals, river improvements and irrigation, aqueducts, water works, sewers and sewage disposal plants, bridges and metal structures, lighthouses, docks, embankments, breakwaters, tunnels, subways: in a comprehensive sense Civil Engineering includes Architecture as a Mechanical Art, in distinction from Architecture as a fine art.

For the purpose of this discussion, I have limited myself to a study of the field of Civil Engineering as practiced in the United States, so we must draw a picture of our conditions a century ago.

A century ago the United States consisted of twenty-six states and the Louisiana purchase which reached westward to the boundaries of the Red River and the Rocky Mountains, the area was 60% of our present area and the population approximately 10%.

In 1800 a man lived essentially the same kind of a life so far as external conditions were concerned as his prototype of six thousand years before. He went as far as his own legs or his horses' legs could carry him. He dug

his ditch, he mowed his hay with the power of his two arms or the help of his wife. In that early day the housewife wielded the axe—for stovewood or logs for the fireplace wherein the iron pot was hung over the fire.

Today the housewife has the electric oven—the thermometer attachment and solenoid brake with time clock to cut off the juice at the end of the proper cooking period.

Let me quote from Past President J. James R. Croes' inaugural address of 1901 for a description of conditions existing a century prior to that time and which may have been repeated in 1833.

"One hundred years ago, the man of enterprise who resided fifty miles from a large city and wished to consult an Engineer regarding a project for a new canal, arose before daylight, struck a spark from his flint and steel, which, falling on a scrap of tinder, was blown by him into a flame and from that a tallow dip was lighted. In the same primitive manner the wood fire was kindled on the kitchen hearth and his breakfast was cooked in a pot and kettle suspended from the iron crane in the fireplace. Entering the cumbrous stage coach, hung on leather springs, which passed his door, he was driven over muddy roads, crossing the narrow streams on wooden trestle bridges, and navigable rivers on a ferry boat, the paddle wheels of which were turned by a mule on a tread mill. At last he was landed in the city where he walked through dirty streets paved with cobble-stones until he reached his destination, a plain three-story brick building founded on sand, with a damp cellar and a cesspool in the back yard. Entering a dark hall he climbed a wooden staircase and was ushered into a neat room, rag carpeted, warmed by a wood fire on the open hearth and lighted by a sperm oil lamp with one wick, for it was dark by this time.

No wonder that before proceeding to business he was glad to take a good stiff noggin of New England rum."

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What has the Civil Engineer therefore accomplished in the past century which has been outstanding in bringing our civilization to a higher plane of living—which has added materially to the health, comfort and well-being of our people.

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With due modesty but with the utmost pride of accomplishment, the Civil Engineer looks back over the century with its epoch-making strides in various fields of transportation, of health and comfort of living, of protection of lives and property, of additions to the capital values of the nation, with the thought that here is a life of usefulness, of upbuilding, of creating, of doing worth-while things honestly and economically, not because of the fee that comes with the job but because his training of exactitude, of honesty of purpose, of direct dealing is inborn.

His greatest achievement is that of having his engineering work judged by his fellow men as of the greatest good to the greatest number.

It is meet therefore on this occasion —during the display of the Century of Progress—in celebration of the birth of a great city, that we shall also have put on record, some of the achievements of a profession which has been active, beneficent and foreful in the making of that great city—Chicago.

Comment: Lack of space prevents printing in full. Copies may be obtained through the American Society of Civil Engineers or the Editor.

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The Century of Progress—What Next?

(Continued from Page 10)

environment, but the average citizen takes most of these new things more or less as a matter of course. Hundreds of thousands of thoughtful people, who have believed themselves reasonably well educated, are going to receive a mental shock when they see, spread out before them, hundreds of things which affect their lives most intimately but which they do not understand and never before realized. Therefore, I believe that this exposition will increase interest in and demand for education in pure and applied science.

I venture to assert that no other branch of learning can compare with science in its educational value. It is the best of all disciplines, since it requires logical, straightforward thinking in which all conclusions can be checked. Bluff, loose thinking, dishonesty, can get nowhere in science. It offers scope for the imagination, limited only by the truth. It has such obvious utilitarian value that this point need not be discussed further. It develops an appreciation of a real art, whose basis lies in simplicity, neatness and adequacy of relationships and forms. But perhaps it is not always realized that it is the most cultural of all studies.

I like to define culture as "the sympathetic appreciation and understanding of life." Our understanding of life rests on science. Before there was science man was a superstitious, ineffective person—afraid of his environment and dominated in his thinking by misconceptions in which he played either a ludicrously self-important or else a fatalistically neglible role. With science have come some understanding of life and its environment and some control of this environment. With this control man has gained free time for thought and new material about which to think. Of course I do not mean that culture is *all* science, but I do mean that pure and applied science are far more basic elements in culture than people generally realize.

The point of view on these matters has changed rapidly in recent years. This exposition will accelerate that change. Science and technology will play an increasingly important part in our educational system. Here I have ventured to make a prediction, though I had planned to leave all prophecying for the next and last subject of my remarks:

IV. What Next?

Prophecy at best is a dangerous pastime, but a certain amount of it is necessary in order to plan intelligently for the future. You have probably all heard the "wisecrack" at the Weather Bureau by some congressmen who suggested, as an economy measure, that the entire service be discontinued except for one man whose sole duty it should be to predict fair weather every day. By so doing he would be right seventy-five per cent of the time, which is better than the present average. (I can't vouch for the accuracy of these figures, nor do I subscribe to the proposed solution. On the contrary, I would point out the great advantages of introducing a still more extensive system than we now have, along the lines of the Norwegian system of Bjerknes which adds upper air soundings to the present type of observation and which has been studied, practiced and advocated in this country by the Massachusetts Institute of Technology and the California Institute of Technology.)

Also the economic forecasters have taken a beating in recent years. In fact, one of the leading critical statisticians of this country told me that, with all the theory and talent engaged in business forecasting bureaus, their average of success was markedly worse than the results which would have been obtained by flipping a coin.

I well remember my first class in geometry. The professor took a piece of chalk in each hand, went to the blackboard, started to draw two converging lines and, as he did so, asked a young lady in the class, "Miss Harris, are these lines going to meet?" "Yes, sir," she replied; whereupon he turned them away from each other and finished them as non-intersecting, divergent lines. "Why did you say they were going to meet?" asked the professor. "They looked as if they would," replied Miss Harris; at which the professor closed the incident with the remark, "Now Miss Harris, if everything in this world depended on looks, where would you and I be?"

In spite of many failures of prediction, we recognize the fact that we must continue to predict as best we can in order to plan our course intelligently. And we realize that the shortcomings of our present efforts are due to faulty technique, arising from inadequate information or imperfect logic, and that we must strive to improve this technique. I will come back to this point later, but will first proceed to consider the matter from a different angle.

The *Second Law of Thermodynamics* is an exceedingly potent principle in science and engineering. From it I would draw a lesson for the future. It may be stated in a variety of ways, one of which is that any system, if left to itself, tends to the state of maximum disorganization. Consider the simplest physical case, that of gas. However its molecules may initially be arranged as to positions and energies, it tends to take on a completely random configuration, in which the energy which it contains is not available. The only scheme ever proposed for breaking up this randomness and making the energy available is the hypothetical Maxwell's Demon, who operated as follows: Imagine, for example, that this room is divided into two parts by an insulating partition provided with a single opening

only large enough for a molecule to pass through, and that this opening is provided with a trap door, operated by the Demon. Whenever this Demon sees a fast molecule coming toward the door from the left he opens it just long enough to let the molecule through. Similarly he lets slow molecules get through from the right. Thus he sorts out the molecules, ultimately corralling the fast ones in the right and the slow ones in the left chamber. In this way he sets up a difference in temperature between the two chambers and is then able to get work done by the gas whose energy originally was unavailable. He did this by exercising his intelligence in the selection of molecules to let through the trap door.

By analogy with this, I would venture the assertion that it is only by the exercise of intelligence that we can avoid the condition of maximum disorganization. Examples of this in human affairs are numerous. Consider, for example, what happens to a farm when it is abandoned. It grows up in weeds, briars and brush. Consider what would happen in the construction of a building, or The Century of Progress Exposition, if it were carried on without intelligent planning and direction. Consider what happens in business if it is carried on without intelligent correlation of production, distribution and sales. Consider what happens in public works construction if this is carried on by the whim of legislatures or temporary officials without an intelligent, coordinated plan of present and future development. Consider what happens in international affairs if each nation, like a gas molecule, bats around intent on its own affairs without reference to its coordination with the actions of others in a well planned, concerted program for the ultimate benefit of all.

So the second law of thermodynamics may be taken to symbolize the necessity of intelligent planning and consistent adherence to the plan if confusion and disorganization are to be avoided. But if men are to work together effectively, there is another point to be considered, which also may be suggested by a scientific analogy, this time from the field of chemistry.

Every chemical bond indicates the loss of a degree of freedom. An atom of hydrogen has three degrees of freedom, those of translation in three mutually perpendicular directions. Similarly an atom of chlorine has three degrees of freedom. But when the two atoms combine to form a molecule of hydrochloric acid, one degree of freedom is lost and there remain only five, three of translation and two of rotation. But in exchange for this partial loss of freedom there are gained new properties and powers which did not reside in the individual atoms themselves.

Similarly in society, every social, political or legal bond represents a certain loss of individual freedom, but through this loss we gain new powers and opportunities. The extreme individualist, who resents any constraint, loses thereby the advantages of cooperation and becomes like a molecule, senselessly batted around by all the contacts which he cannot escape.

Modern engineering developments have created new and tremendous bonds between people. Transportation, communication, modern methods of production,—all these major items of progress which are exhibited at this Century of Progress, have the effect of making people more interdependent. They are interdependent for food, clothing, education, ideas, and, in fact, in practically all their activities. They have thereby lost many of their individual degrees of freedom, but have gained tremendous new powers and opportunities. This, I believe, is by far the most significant feature of the Century of Progress. It is a feature which is as yet inadequately realized. Many individuals, and industrial groups and nations are still trying to live like free atoms when they are really parts of a great organism. Failure to realize this results in strains which sometimes develop into cracks. I take it that the great problem of mankind is to learn how to surrender antiquated degrees of freedom and how best to use the new powers and opportunities which come from cooperation. Since the engineers have largely created this problem, it is largely up to them to lead in its solution. I could quote many examples to show that they are beginning to do so.

Let me now approach the question, "What Next?" from still another angle. I once heard a quotation from a Greek philosopher which went something like this: "It is not by sacrifices or the mysterious power of the Oracle that we may look into the future, but by giving thought to the past, which we know." Let me draw certain lessons from the past.

The *evolution of social philosphies* is significant. In earliest times life was entirely individualistic, each family being a law unto itself. Later, as population increased and concentrated, there came a period of autocracy in which an individual, or a group, ruled by force of might over the subjugated peoples. With the French and American revolutions came the period of democracy in which the rights of the individual were supreme, in sharp contrast to the preceding order. In America, with its almost boundless resources and opportunities for individual enterprise, this developed into an extreme individualism. As the countries resources became more completely exploited and the population increased, there developed a period of intense competition—free, cutthroat and individualistic. Really as a part of this competition came gigantic combinations, trusts, whose abuse of power let to over-drastic governmental control. We have recently suffered and still suffer from this mixture of unrestricted competition and unwisely restricted combination. What is the way out? It must be by some form of cooperation in which the interests of the public will be paramount, but which will still leave room and incentive for individual enterprise without which future progress would be suppressed.

The trends in industrial activity are also significant. In the general period of the Civil War our great railroads, which form the backbone of our transportation system, were the outstanding achievement of the time. Then came a period of development of machine tools and their employment in manufacturing and farming to give what we call mass, or quantity production. Then, mostly since 1910, has come industrial research on an increasingly important scale. This research has been directed toward new products—such as the automobile, radio, airplane, mineral and oil products, food and medicines, and also to the invention of new materials for construction—such as plastics, stainless and hardened steels, rayon and the like. Still more recently research into and control of business and personnel management and of production have appeared on the horizon.

A survey made by the Division of Engineering and Industrial Research of the National Research Council, two or three years ago, showed strikingly the fact that the most prosperous industries are those which spend considerable funds in research. There are many illustrations which might be cited. For example the electrical and chemical industries, founded upon and maintained by research, have prospered. The railroads, on the other hand, have lost their pioneering spirit and have become perhaps the most stagnant, and unprogressive of our great industries. They spend relatively nothing upon research either into new ways of serving the public or of improving their equipment. With a few fortunate exceptions their attitude is typified by the remark made to me by a railroad president: "There is really no need for engineers in our organization; we can always go out and hire one when we have a job to do!" This man was entirely oblivious to the value in his organization of young men with technical training and progressive ideas who might put life and vigor into his industry, which is bewilderedly taking jolt after jolt from competitive agencies which, had it been progressive and alert for public service, it would itself have developed or cooperated with. In fairness to the railroads, it should be noted that their hands are partially tied at present by the inflexible nature of agreements with their employees, notably in respect to the seniority rule.

Continual research and alertness to give public service are the essential conditions for success, and even for survival, in this age of technology and of social interdependence.

You will have noted that, from every angle of approach, the survey of recent progress leads to a definite conclusion: we are entering an age in which the conditions for success will be intelligent planning, based on research, and general cooperation in such a planned economy. Research and cooperation are the key ideas. Engineers have the unique opportunity in this program, since their work is constructive in exactly the lines in which lie the greatest problems. It is no mere chance that the "strong-arm" man of the administration, Director of the Budget Lewis Douglas, is an engineer, or that the three men first chosen to advise in the administration of the Reconstruction Act, Gerard Swope, A. P. Sloan and Wal-

ter Teagle, are all engineers, or that Director Sawyer in charge of the federal public works program is an engineer, or even that our ex-president, who struggled manfully against overwhelming odds, was an engineer.

In conclusion I could recite a whole list of specific predictions based on these considerations, such as:

(1) Research in pure science, engineering and social science will receive increasingly greater attention and ways will be found to make it more effective.

(2) Society will exercise increasing control over business and industry to insure that the best interests of the public be served. This will inevitably include measures for stabilization of employment, control of production, safe-guarding of investments.

(3) Technogical education will be increasingly recognized as a most valuable preparation for a satisfactory life in this technological world, as well as the *necessary* training for that large special group who themselves develop, build and operate the world's machinery.

(4) Because of the engineer's responsibility, it is important that he have a more adequate sense of social responsibility and training to discharge humanitarian as well as technical responsibilities effectively, and these requirements will be reflected in modifications in the present methods of his college training.

And so on, I might list a great variety of details. But they all sum up into three conclusions: There is a tremendously important job to be done in the world,—a job which has arisen in large part because of the work of the engineer. The engineers of the present and future have a tremendous opportunity and responsibility for doing this job. If they don't do it, then we may expect a great mess,—a la the second law of thermodynamics.

Perhaps this sounds as if I were a Technocrat. If so, I hope that I am an optimistic technocrat and not a pessimistic one,—and also I hope that my arguments are more valid than those which explained technological unemployment as follows:

In Great Britain, one hundred years after Watts invented the steam engine, the textile factories were run by steam engines and employed 40,000 workers. Had the old fashioned hand operated looms been employed, it would have required 40,000,000 workers to produce the same amount of textiles. Thus there were 39,960,000 people technologically unemployed. But the population of Great Britain was only 19,000,000 Thus there were 20,960,000 technologically unemployed unborn babies, which shows what terrible things the machine age has brought upon us.

I think, however, that there is every reason for optimism. There are plenty of interesting things to be done in the world. This Century of Progress Exposition has concentrated attention on many of them and created a psychology of satisfaction, optimism and ambition. I think that we should view the future seriously, but that we have reason to look forward confidently.

See acknowledgment of conclusion of address by Edward J. Mehren, page 22

The Contribution of Engineering to Progress

(Continued from Page 11)

can go forward joyously to happiness, to more uniform enjoyment of this world's goods, to high intellectual and moral attainment?"

Engineering In Itself

I take it that it is entirely unnecessary to speak of engineering achievements in themselves. The whole world concedes that in every branch of engineering our machines, mechanisms, processes and structures outstrip those of any previous day.

We are interested tonight, however, not primarily in machines but in their effects.

Contribution To Social Progress

Our first inquiry properly relates to the influence of engineering on social progress; that is, on the distribution of wealth, on its effect on men—its effect on them externally and in their relations to others.

We are here not in the realm of conjecture but of fact. We find that in the Western world today, more than ever in man's history, the mass of men are better fed, better clothed, better housed; health is better, life has been prolonged, infant mortality reduced; elementary education well-nigh universal; secondary and advanced education available to all who would have it; liberty greater; opportunity for individual advancement unhampered; justice more equitably distributed. In fine, there is a higher standard of living, and a very high order of social advancement.

The question of wealth deserves special consideration. Wealth today is not only greater in the aggregate, but more widely diffused. The distribution is not entirely equitable, but it is not so disproportionate as those imagine who think only of private property and forget the immense treasury of community wealth. The first is the possession of the individual; the second, the possession of all, for their comfort, convenience and use. In community wealth never were people richer—in the number and quality of streets and roads, in the purity and amplitude of water supply, in the sanitation and lighting of cities, in fire and police protection, in courts of justice, in medical, educational and recreational facilities.

How can we account for this increase in the standard of living, this extraordinary social progress, this wide diffusion of wealth?

The explanation lies in a profound but very simple fact, as fundamental and as elemental in the economic order as the commandment, "Thou shalt not steal," is in the moral. If we are to appreciate the significance of the engineer and the engineering age, if we are to comprehend the world through which we have been passing, if we are to penetrate the present economic convulsion, and understand the economics of what is ahead, we must understand this primal fact and let it sink into our consciousness. That fact is this: *that through the engineer's development of power we produce wealth more rapidly today than at any previous period in man's history.*

It is this increase in the rate of shall judge it? Not I. There is no wealth production that has given us the facilities, conveniences, comforts and advantages of which I have spoken. To this do we owe our great private and community wealth, our high standard of living, our high level of social advancement.

We must conclude, therefore, that engineering, by increasing the production of wealth, has made an extraordinary contribution to man's social progress, it has builded high the bridges over the chasms that hindered his social advancement.

Thus do we answer the first part of our inquiry.

Intellectual Development

We come now to the second part. Has engineering contributed to intellectual and moral development, has it bridged at higher levels the chasms that have held back his spiritual progress?

Here our critics will rage. The age is decadent, they tell us; we are flabby intellectually, we have backslid morally. We have much information, they say, but little wisdom; alert perceptions but little culture; athletic bodies, but no rigidity of moral character.

Are we able to answer the indictment?

There may not be a single luminary today of the brilliance of Shakespeare, or Dante, or Aristotle, but our age *is* one of striking intellectual vigor and activity. We must not make the mistake of coloring the entire Elizabethan age with the stature of Shakespeare, nor think that the whole Greek world was up to Aristotle's level.

If our galaxy has not a dominant luminary, it nevertheless has many great suns. In every line of human thought, the output of our researchers is prodigious. If an age is to be judged by the sum total of its contributions to human knowledge, then ours must be given high rank.

Each age, too, has its own *zeitgeist*, the spirit of the age. Ours is science, pure and applied. In those fields we are making an intellectual contribution of stupendous proportions. In astronomy, physics, chemistry, biology, medicine, engineering, we stride with seven-league boots.

We claim, too, as an intellectual accomplishment the spread of education, common, secondary and higher, to the masses of men in the Western world. To reclaim people from ignorance, to open to them the storehouses of knowledge and of wisdom, to make possible, yes easy, for anyone who wishes to secure it the very highest education, is indeed an accomplishment of which the machine age may justly be proud. That the education of the will has not gone along as lustily as the education of the intellect is a charge we will have to admit, but it does not completely negative the intellectual achievement.

Yes, my friends, even in the intellectual sphere, the resources of wealth furnished the Western world by engineering have enabled mankind to raise higher the bridges that span the chasms of ignorance and prejudice, and bring nearer the day of the great high road for attaining humanity's goal.

Moral Condition

But what of our moral life? Who

more difficult task for the historian than to determine the moral tone of an age—to strike the average from king to peasant, from president to humble citizen. In this respect no age can be sure of its appraisal of itself. The human soul—the millions of human souls of the Western world—cannot be weighed nor calipered.

Certainly we are not morally what we would like to be or ought to be. That can be said of our intellectual stature as well.

But if our age has not risen to the intellectual and moral standard that we would wish, if we have not raised to top height the bridges over the chasms that handicap our intellectual and moral lives, the fault is not that of the engineer, but of the very teachers, religious leaders, economists and statesmen who are today his critics. We find here another fundamental and elemental principle that should be stressed as strongly as the rapidity of wealth production. It is this: that the engineer has created an environment far more favorable to widespread intellectual and moral growth than the world hitherto has ever known.

Let that, in turn, be *our* challenge.

Our work has been well done. We have removed the burden of toil from the backs of men; we have made them masters of power rather than power machines; we have discounted their sinews and exalted their minds; in freeing them from drudgery, we have given opportunity for the use of their intellects—that part of their natures made in the image and likeness of God; we have placed education at their disposal; we have assisted in freeing them from disease and prolonging their lives; we have shortened the hours of labor; we have given them leisure in which to invite their souls and grow morally and intellectually.

Here is an environment for spiritual growth such as the world hitherto has never known. Possibly humanity moves too slowly to make full use of this environment at once, but blame not the engineer for the failure.

Failures Of Our Critics

It is because the economist, financier, the statesman, the teacher, the religious leader have not been able to keep pace with the engineer that untold difficulties arise. The more rapid creation of wealth has changed the whole base of Western civilization. It is the misunderstanding of this factor and the failure to recognize its profound and all-pervasive influence on finance, business, the distribution of wealth, national and international politics, and on human thought and outlook, that have thrown the Western world into its present crisis and baffled its statesmen. A few homely examples will illustrate the point, without going into the intricaties of finance or international politics.

Machine-power agriculture on the one hand, and industrial development on the other, have removed millions from their attachment to the soil, concentrated them in the cities and deprived them of their security. As Dr. Steinmetz put it, they have been exposed to the three great fears—*fear of unemployment, fear of illness, fear of an unprovided-for old age.* And while this has been brought about by the progress of power, the statesman, the financier, the economist have not kept pace and found ways of banishing these fears and, by using the new wealth, to restore the security that men enjoyed when attached to the land.

Second, there has been tardy recognition that too large a proportion of the wealth created by the machine has been reinvested in more machines and too little diverted to consumable goods and community services. It is one of the keen lessons of this depression that an age that creates wealth as fast as this one does will have much of that wealth confiscated during depressions if too large a proportion goes back into the extension of production facilities. Here again, finance and political economy lag behind the work of the engineer.

A final illustration: Highway transport—the combination of the hard road and the automobile—has made township government and small counties obsolete—survivals of the horse-and buggy days. Township governments should be abolished, counties consolidated. The automobile makes it logical, but the politician insists that the anachronism continue.

Not Entirely To Blame

But if these other groups have not been able to keep pace with the engineer, we should not be too critical. We have behind us 60 centuries of recorded history, in only two of which has modern engineering been a factor. In fact, Watt was a man of only yesterday. We can almost touch his times. He died in 1819, and the grandparents of many of us in this room might well have known him.

The machine age, then, has been operative for less than 3 per cent of recorded history. It is still a new instrument in the life of the race. We have not learned its mastery. We have not made it fully servant of the whole of mankind.

In the early days of steam engineering there were heaven-crying cruelties in its application. Strong hands seized the new wealth-creating mechanism and turned it to their own selfish ends. Engineering at that time instead of bridging chasms, was used by greed to dig them deeper.

Later, as its benefits became more widely diffused, we used its gifts too lavishly. Our whole age, everyone of us, is of the new rich in a large sense; and we used the new wealth—as the new rich always do—extravagantly, lavishly, even boisterously. We have not had the strength to resist the complexity and material temptations of the new wealth and patiently, calmly, taking advantage of the superior environment, let it work out in us a holy enlargement of intellect and soul.

But be assured that we are mastering, we will master the new instrument. Much of what has been going on in Washington in the last three months is an effort in this direction. The phrase "the forgotten man" is not a mere political catchword but the expression of a fundamental social philosophy.

Our contention, then, is that we engineers have not only builded higher bridges across the chasms, but have furnished the materials for still higher bridges if the statesmen, economists, teachers can learn to use them.

We believe that there has been a century of progress.

Conclusion

Solemnly tonight we look back on the arduous work of the race, struggling through 60 centuries or more in its effort to raise a high road over which to travel to its destiny—widespread happiness, with reasonable physical comfort, a high intellectual level, and a high moral order. In the nearly two centuries of steam power, engineering's record is not clean. In its early days, seized by greed, it tore down bridges instead of raising them. Latterly though, it has been made more and more the servant of the race, it has raised high the bridges over the chasms that impeded social progress; it has helped bridge the chasms of ignorance and moral turpitude by creating an environment far more favorable to intellectual and moral development than in the past.

It is in the faith that he was making a contribution to the race that the engineer has worked in the past 100 years, faith that he was bridging the chasms on the highway of mankind. In that faith will we and our successors carry forward in the century ahead so that when *its* history is written, it may more truly be set down as a century of progress.

In that faith will we work, not primarily that man may have greater comfort and more leisure, but that these may contribute to a more vigorous intellectual and a higher moral life.

"Not in bread alone doth man live but in every word that proceedeth from the mouth of God."

Comment:—The American Engineer wishes to acknowledge the courtesy of Mr .George T. Seabury, Secretary of the American Society of Civil Engineers, and Mr. Edgar S. Nethercut. Director of the Western Society of Engineers.

Through the assistance of these men the Editor was enabled to obtain at the time copies of the addresses delivered during the joint dinner assemblage of Engineers recently held in Chicago.

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General News and Comments

ENGINEERS TO COMBAT UNFAIR PRACTICES

(Continued from Page 12)

hardly be expected to act in a humane and ethical manner in the face of such inconsistency.

"Under the Industrial Recovery Act, inaugurating both regulation of industries and a nation-wide public works program, provision has been made for minimum wage scales and short working hours for employees. This same provision offers a prospect that the profession cannot afford to ignore. Some regard it as an opportunity to secure governmental authority for a fair code of practice and compensation for engineers; others regard it as an invitation to engineers to affiliate with labor. Already there is an undercurrent amongst the thousands of unemployed members of the engineering calling to forsake the ideals

and hopes of a profession for the protection of a labor union.

"It is the duty of engineering agencies to take cognizance of this situation and the Professional Engineers United Front Committee for the Metropolitan District of New York and New Jersey, comprising representatives of practically all Metropolitan engineering groups, herewith petitions the (name of Society) to give consideration, during the deliberations of its Convention to be held in Chicago during the week of June 26th, to the conditions herein set forth.

"D. B. STEINMAN,
"Chairman,

Metropolitan United Front Committee.

American Society of Civil Engineers

American Society of Mechanical Engineers

American Institute of Electrical Engineers

American Institute of Mining and Metallurgical Engineers

American Institute of Chemical Engineers

American Association of Engineers

Western Society of Engineers

Society for the Promotion of Engineering Education

National Council of State Boards of Engineering Examiners

American Society for Testing Materials

American Concrete Institute

The replies to date indicate a cooperative spirit that promises to prove a valuable asset to the Committee which proposes to carry the case of the engineer directly to public authorities and legislative groups of the City and State of New York. At the suggestion of President Chapman similar activities will be conducted throughout the State. It is intended to give widespread publicity to the evils and abuses complained of. It is hoped that national agencies will also act to the end that the profession may present a real united front. Already some splendid work has been done by Mr. George T. Seabury, Secretary of the American Society of Civil Engineers, through dignified appeals and the submission of data to authoritative sources.

Assurances of cooperation have come from almost every society invited to affiliate in the endeavor and Chairman Steinman will shortly be as busy as he was when President of the New York State Society of Professional Engineers.

The following have, to date, been invited by Chairman Steinman to serve as members of the United Front Committee:

Thomas C. Desmond, George T. Seabury, Calvin W. Rice, Philip W. Henry, N. A. Richards, Frederick Ward, Morris R. Sherrerd, Arthur V. Sheridan, V. T. Boughton, John C. Riedel, Fred H. Zurmuhlen, Ralph H. McKee, James H. Griffin, Homer G. Balcom, John Avery, J. Franklin Perrine, A. C. Forbes, Arthur Richards, John G. Eadie, E. P. Goodrich.

A. L. BROCKWAY DIES

(Continued from Page 12)

inent member of the Architectural Profession, passed away.

Mr. Brockway was a most ardent advocate of Registration and contributed greatly to the establishment of high standards for admission to the practice of engineering as well as architecture. A strong champion of the architect he was instrumental in bringing about harmony between the architectural and engineering professions in this State. To his family the American Engineer extends condolences.

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Examination Questions

(Continued from Page 13)

of tooth. Tell what factors governed your design.

9 It is desired to put the boilerhouse crew of an industrial plant on bonus, this to depend on their efficiency in generating steam. What factors would you select as measuring their efficiency and on what reports would you calculate bonus results? What instruments and tests would be required to determine performance?

10 By what methods is the hardness of steel measured? How is it recorded? Explain the meaning of some of the indices to which you refer.

(Continued in Next Issue)

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New York Chapter News

(Continued from Page 14)

lapsed licenses the Chapter has requested the Executive Board of the State Society to furnish it with such information pertinent to the matter as may be available.

The Chairman of the Legislative Committee, Prof. John C. Riedel, made an arrestingly interesting report upon a joint endeavor which has been recently inaugurated by the State Society in cooperation with national, state and municipal Engineering associations in the Metropolitan District to formulate plans to prevent, as far as possible, the drastic reductions in Engineering salaries and positions which are being increasingly made in governmental departments and agencies.

The Chairman of the Building Code Committee, Mr. Charles R. Ward, reported that the committee attended a recent hearing by the Board of Aldermen of the City of New York, on the Proposed Building Code, and recommended modifications of certain administrative sections of the Code which are unwarrantably discriminatory against proper Engineering practice in the field of building construction.

The Membership Committee, through its Chairman, Mr. John E. Setchell, reported that six (6) applications for membership had been received. These applications had been secured by an unemployed member of the Chapter under an arrangement whereby the soliciting member is paid a percentage of the membership dues of new members enrolled as a result of his solicitation. Twelve (12) new members were reported in the June issue of the American Engineer to have been secured by the same means (possibly by the same member) and it is evident that the policy established is notably effective and worthy of adoption by other Chapters of the Society.

The attention of the Chapter was directed to certain numerous and flagrant violations of the Engineers' Licensing Law by brokers, agents and representatives of fire insurance companies and the matter will be laid before the New York Fire Insurance Exchange in an endeavor to secure the cooperation of that body toward speedily terminating illegal practices of an Engineering nature in the fire insurance field.

The following committees were appointed for the 1933-34 season:

Legislative—John C. Riedel, Chairman; Frederick Ward, W. W. Kunze.

Membership — John E. Setchell, Chairman; Walter M. Purdy, William M. Wepfer, Max Ungarleider, Frederick E. Lane.

Ethics and Practice—Edward J. Squire, Chairman; Adolph Shpiesel, John L. Hogan, W. W. Kunze.

Publicity—Roy C. Cram, Chairman.

Program—(Unfilled), W. E. Paulson, Fred Wackenhut, Edmund J. McCormick.

Employment—Edmund J. McCormick, Chairman; Roy S. Moore, John J. Donegan.

Building Code—Charles R. Ward, Chairman; William M. Wepfer, Frederick Ward, L. S. Stiles, ex-off.

Revision State Society Constitution —John C. Riedel, Chairman; Frederick Ward, Roy C. Cram, Frederick E. Lane.

Cooperate with 10-Year Plan Committee and Port Authority—Frederick Ward, Chairman; James C. Meem, Charles W. Burke, Miles I. Killmer, L. S. Stiles, ex-off.

Restriction of Appraisals—Edmund J. McCormick, Chairman; Charles R. Ward, Dr. Erich Hausmann.

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JEFFERSON-LEWIS COUNTIES

The Jefferson-Lewis Counties Chapter has reported, through the courtesy of its Secretary, A. H. Emerson, that it held six (6) meetings during the past business season at which the following lectures were delivered:

October 18th, 1932: The Use of Latex, or Raw Rubber, in Paper Products; Mr. Henry Perry, of J. P. Lewis Co., Beaver Falls, N. Y.

December 21st, 1932: New Processes of Producing Wrought Iron; Mr. G. L. Biggs, of the A. M. Byers Co.

February 13th, 1933: The Hoover Dam and Related Projects in the Southwest; Mr. William T. Field, Consulting Engineer, Watertown, N. Y.

March 15th, 1933: Concrete in Modern Architectural Practice; Mr. R. R. Zipprodt of the Portland Cement Association.

April 19th, 1933: Cast Iron Pipe; Mr. E. W. Hermann of the American Cast Iron Pipe Co.

May 31st, 1933: The Proposed St. Lawrence Seaway and Power Development; Mr. Joseph P. Burns of Burns Bros. and Haley, Contractors.

The Chapter has adopted the practice of sending notifications of lectures to all persons—members and non-members of the Engineering profession—who might be interested in

the subjects discussed. This practice has resulted in attracting many non-engineering members of the community to Chapter gatherings where they became better acquainted with the problems and interests of their Engineering neighbors.

The following officers were elected for the 1933-34 term: President, E. S. Cullings; Vice-President, L. P. M. Gaylord; Treasurer, H. R. Dwyer; Secretary, A. H. Emerson; Director for 3 years, C. E. Kinne and Isle R. Wisner; Director for 1 year, H. F. Halladay.

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BRONX COUNTY

The Bronx County Chapter held its last meeting of the 1932-33 season on June 1st at the Concourse Plaza Hotel at which approximately 100 members and guests were present.

Hon. J. P. Revile, Commissioner of Buildings of the Bronx, was the guest-speaker at the meeting. Mr. Reville—an acknowledged expert in Building Construction—has the distinction of serving as the Superintendent of Buildings of the Borough of The Bronx for 24 years, during which time he earned a most enviable reputation for fairness, firmness and efficiency in the discharge of his official duties. He is not only popular with the Engineers, Architects and Builders with whom he contacts in the building field, but because of his admirable public record and his interest and activity in matters of civic betterment, is regarded as one of the outstanding citizens of The Bronx—a political sub-division which, if it were a city, would be the sixth largest municipality in the United States.

Mr. Reville reviewed the reasons for the creation of the City Building Commission and outlined the duties which had been transferred to it from the Tenement House Commission, The Bureau of Fire Prevention and the Police Department. He described the organization of the commission and its functions under the law. His discourse, replete with anecdotes and unusual experiences garnered during his long public career, was entertaining and instructive and the enthusiasm of the applause which followed it gave unmistakable evidence both of appreciation of his address and of the high esteem in which he is held by the members of the Engineering Profession of The Bronx.

The presence of Mr. John Steinmetz, President of the Real Estate Board of The Bronx, was gracefully acknowledged by Mr. Joseph F. Lamb, President of the Chapter, who presided at the meeting.

Mr. Raymond C. Van Wagner, Vice-President of the Chapter and Chairman of the Publications Committee of the State Society, urged the members to advertise in, and secure advertisements for, the American Engineer in order that necessary financial support be given to the State Society publication. He also announced, as Chairman of the Outing Committee, that arrangements had been made for a Chapter Outing on Wednesday, August 16th, at Milton Point Casino, Westchester County.

RICHMOND COUNTY

The Richmond County Chapter held its regular meeting on June 8th at the Institute of Arts and Sciences in St. George, Staten Island.

The Chapter delegates to the Richmond County Transit Conference reported that encouraging progress had been made toward securing governmental approval of the construction of a rapid transit tunnel connecting Richmond with Manhattan by way of Brooklyn and that Mr. Fred H. Zurmuhlen, President of both the Conference and Chapter, together with Mr. Herman W. Ordeman, Chairman of the Chapter Transit Committee, had effectively pleaded Richmond's cause at a hearing before Hon. John P. O'Brien, Mayor of the City, as representatives of the Conference. These Engineers were also requested by the Richmond Borough administration to act as consultants to the group designated by the Board of Estimate and Apportionment to make application to the United States Government for a loan to aid in financing the project in accordance with the provisions of Title II of the Industrial Recovery Act. Mr. Zurmuhlen and Mr. Ordeman in company with Hon. John A. Lynch, President of the Borough of Richmond, Hon. Henry Hesterberg, President of the Borough of Brooklyn, Hon. David S. Rendt, Commissioner of Public Works of Richmond and Congressman Anning S. Prall, journeyed to Washington and laid the tunnel case before Colonel Donald H. Sawyer, Federal Emergency Administrator of Public Works under the Recovery Act. The mission was highly successful and the tunnel project is now advantageously placed on the list of public work projects which the City desires to advance.

Mr. Zurmuhlen has delivered several radio addresses on the subject of the Richmond-Brooklyn-Manhattan tunnel and the public press of Manhattan and Richmond has carried many commendations in news and editorial columns of the work of the Professional Engineers in advancing the improvement.

The Public Relations Committee under the Chairmanship of Herman W. Ordeman reported sixteen (16) cases where the Licensing Law is being violated by illegal practice or misapplication of the term "Engineer." Corrective measures are being taken by the Chapter and success is anticipated in all cases, except possibly one in which the Committee has collected evidence for submission to the District Attorney if prosecution becomes necessary.

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STEUBEN AREA

Mr. W. O. Drake, President of the Steuben Area Chapter, has reported that a notably enthusiastic Chapter meeting was held at the Hotel Langwell, in Elmira on June 13th, at which the following distinguished guests were present: Hon. Glenn Sweet, Mayor of Elmira; Hon. Alfred G. Hood, Mayor of Corning; Hon. Andrew J. Maltby, Commissioner of Public Works of Corning.

Mr. Arnold G. Chapman, President of the State Society and Chief Engineer of the Albany Port District Commission, the guest-speaker of the meeting, delivered an informative and interesting illustrated lecture on the development of the Port of Albany, describing the construction of its docks, railroad facilities, warehouses and its grain elevator which is the largest in the United States.

The following directors were elected and committees appointed:

Directors for 3 years: M. W. Wipfler, Elmira; O. J. Dempster, Hornell.

Directors for 2 years: A. M. Tietzel, Corning; J. J. Oakes, Andover.

Directors for 1 year: A. C. Jordan, Elmira; N. R. Wickersham, Corning.

Membership Committee: R. Fitzpatrick, Hornell, Chairman; C. E. Smock, Corning; M. W. Wipfler, Elmira; F. E. Marvin, Kanona; S. O. Steere, Hornell.

Publicity and Legislation Committee: A. J. Muench, Friendship, Chairman; A. M. Tietzel, Corning; J. M. Lynch, Hornell; M. W. Wipfler, Elmira.

Ethics and Practice Committee: Gordon Edson, Hornell, Chairman; W. B. Timbrell, Elmira; K. F. Thompson, Bath; D. A. McClellan, Hornell.

Public Relations Committee: H. E. Gough, Elmira, Chairman; O. J. Dempster, Hornell; N. R. Wickersham, Corning; T. F. Nichols, Hornell.

Arrangements Committee: H. F. Eilers, Corning, Chairman; J. H. Adoph, Hornell; A. J. Nicholson, Hornell; A. C. Jordon, Elmira.

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MONROE COUNTY

The regular meeting of the Monroe County Chapter which was scheduled for June 19th was postponed, subject to the call of the Chair, to enable Committees, engaged in making studies of certain projects in which the Chapter is interested, to complete their reports.

Mr. Charles W. Marvin, President of the Chapter, has reported that Mr. Homer W. Storey, a member of the Chapter, has been appointed to serve on the Beverage Control Board and that the monumental $4,000,000 County Building which was designed by Siegmund Firestone, Engineer and Architect, who is also a member of the Chapter, is nearing completion.

Mr. Marvin, who is a member of the Port of Rochester Committee of the Chamber of Commerce, has forwarded a page from the "Rochester Commerce" publication which contains the following statement:

"Our Board of Trustees," (of the Rochester Chamber of Commerce), "at its last meeting unanimously adopted the following resolution:

"That the Senate of the United States be requested to delay the adoption of the St. Lawrence Treaty until an impartial survey can be made by the Board of Rivers and Harbors Engineers of the traffic which the United States may reasonably expect to move via the St. Lawrence route, to show the savings and benefits, as well as disadvantages, to the United States therefrom; that the board determine definitely the annual costs of operation and maintenance and the possibility of making the project self-liquidating within a reasonable period of years; also study of such other factors as are essential to the determination of the wisdom of undertaking this

development under the present economic conditions and trends."

The action of the Rochester Chamber of Commerce is interesting. The St. Lawrence waterway and power Project is a gigantic undertaking and deserves thorough investigation by the Engineers of New York State. In passing it is recalled that a motion made at the Winter meeting of the State Society which was held in Albany in February, 1932, to the effect that the Chapters study the merits of the project, was tabled on the ground that the subject was loaded with political dynamite and that expression of conflicting opinions by different Chapters would tend to create disharmony in the Society.

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WESTCHESTER COUNTY

The transactions of the meeting of the Westchester County Chapter which was held at the City Hall, Yonkers, on June 5th have been reported by Mr. Francis J. Laverty, Secretary of the Chapter.

Mr. Theodore T. McCrosky, Planning Director of the Yonkers Planning Commission, the guest-speaker of the meeting, was introduced by Mr. Chris J. Sheridan, City Engineer of Yonkers and Director of the Chapter, at the request of Mr. John Avery, President of the Chapter. Mr. McCrosky gave an interesting account of the measures and plans which have been formulated by the Planning Commission for expediting the flow of the ever-increasing volume of vehicular traffic along the city's thoroughfares; for relieving traffic congestion with its resulting financial loss due to delay of transportation; for the prevention of motor vehicle accidents; and for the general beautification of the highways of Yonkers for the greater appreciation of its land values and for the greater satisfaction of its inhabitants.

President Avery reported that he had contacted with the Westchester Society of Civil Engineers to promote the closest possible cooperation between that Society and the Chapter in protecting and advancing the interests of the profession and its members.

Mr. Joseph Barnett, Chairman of the Legislative Committee requested that additional members be appointed to serve on the Committee in order that reported violations of the licensing law be expeditiously investigated and the necessary corrective measures quickly determined and recommended.

Mr. James M. Duffy, Chairman of the Engineers' Status Committee, reported that arrangements were being made for a meeting between the committee and the Board of Directors of the Contractors' Association for the purpose of discussing means of improving coordinated action between Engineers and Contractors of responsibility, reputation and experience, to the end that construction work will be prosecuted with the greatest efficiency and with the greatest benefit to the Public, the Engineer and the Contractor.

Mr. Harold W. Watt reported that plans are being perfected for awakening the interest of the Engineers of tomorrow—the Engineering student and the recent graduate—in the Society, by acquainting them with its aims, purposes and activities.

A special committee composed of Mr. John Avery, Chairman, and Messrs. W. Frederick Welsch, James M. Duffy and Andrew M. Anderson was appointed to make a study of the National Industrial Recovery Act and to initiate cooperative action by Engineers, Architects, Contractors and Trade Representatives whereby the maximum benefits available under the Public Works section of the Act will be secured for Westchester County and its people.

Mr. Leslie G. Holleran, Chairman of the Unemployment Committee, reported that curtailment of the activities of the Emergency Work Bureaus of the County made it increasingly difficult to find work for unemployed Engineers. He stated that the early resumption of public work on a large scale offers the only solution of the unemployment problem and exhorted the Chapter to aid in every endeavor to scure financial assistance from the Reconstruction Finance Corporation or from the Federal Government under the Industrial Recovery Act to enable the County and Municipal governments of Westchester to authorize and contract for the many physical public improvements which have now become urgently necessary.

* * *

NEW YORK COUNTY

Mr. Homer G. Balcom, the distinguished consulting engineer in the field of steel construction and President of the New York County Chapter, has submitted the following information of the activities of his Chapter.

Dr. Ralph H. McKee, head of the chemical engineering department of Columbia University, is the Chairman of a special committee which is engaged in the preparation of a schedule of engineering fees and salaries. It is Mr. Balcom's opinion that a clear statement of what, in the judgment of the Engineering Profession, are fair engineering salaries is of vital importance at the present time when, due to the depression emergency, the salaries of of engineers, in many instances, are being forced down to unconscionably low levels. Mr. Balcom states that he is therefore crowding this committee to submit a report of its recommendations at the earliest possible moment.

A committee, under the Chairmanship of Mr. T. Hayden Hamilton, an associate Editor of the American Engineer, has been apointed to make a study, and recommend desirable revisions, of the charter of the City of New York. This Committee will cooperate with similar committees of the other Chapters of the counties within the confines of the greater City and every effort will be made to prevent unfair discriminations against Engineers and to provide for the appointment of professional Engineers to all positions which should properly be filled by Engineers.

Another committee, under the Chairmanship of Mr. Maurice Goodman, will be appointed to assist, as far as possible, in the work of the United Front Committee composed of representatives of Engineering organizations within the Metropolitan District) which was created on June 14th, under the leadership of Dr. D. B. Steinman, to establish fair standards of employment and remuneration for Engineering services.

* * *

ALBANY COUNTY

The Albany County Chapter held the first of the so-called Tri-County Social Meets of the Albany, Rensselaer and Schenectady County Chapters on June 5th at Van Schuyler Hall in Albany. The meet was presided over by Mr. Edward E. Sheldon, President of the Albany County Chapter.

Mr. Arnold G. Chapman, President of the State Society, gave an interesting description of the outstanding events of the Annual Meeting of the State Society and outlined the plans he has prepared for advancing the work and prestige of the organization.

Col. Hugh Miller, the first president of the Schenectady County Chapter, William B. Landreth, Director, and W. C. Strecker, Secretary-Treasurer of Schenectady County Chapter discussed the expansion possibilities of the Chapter in the City of Schenectady where large numbers of Engineers are employed by the General Electric Co. and where Union University, the educational laboratory which has produced many Engineers of eminence and distinction, is located.

Mr. Landreth reported upon an article which recently appeared in the public press of Schenectady which set forth objections by certain members of the faculty of Union University to the aims and activities of the State Society. The discussion aroused by the article prompted its author to make a more thorough investigation of the work and policies of the Society with the gratifying result that the additional information he secured transformed his criticism into commendation.

Mr. Grant E. Palsgrove, Secretary and spokesman of the Rensselaer County Chapter representatives to the Meet recounted interestingly the activities—past and prospective—of his Chapter.

Mr. B. M. Brock, of the Carnegie Steel Co., delivered an informative address on the smelting and manufacture of steel.

After the more serious business of the Meet had been transacted a most enjoyable Dutch Lunch, which had been provided for the occasion by the Social Committee, was served and the members of the Committee busied themselves in the pleasurable task of introducing everyone to everyone else. The spirit of good-fellowship presided over the gathering and the hall resounded with the laughter provoked by countless witty quips and sallies. The first Tri-County Social Meet was unanimously voted a great success and will be followed by others after the summer intermission.

The report of the Meet was received through the courtesy of Mr. C. H. MacCullogh of Albany County Chapter.

* * *

ONEIDA COUNTY

Early in May an informal Get-Together meeting was held in the City Club of Utica at which a considerable number of members and prospective members attended. At this meeting the policies and purposes of the State Society were explained and a program of activities announced. The program

was enthusiastically approved and the visiting Engineers gave evidence of being favorably impressed by the work of the Chapter—a number indicating their intention of applying for membership.

The regular meeting of the Chapter was held at the Elks' Club in Utica, on May 25th.

Mr. Charles Kiehm, President of the Chapter, made a graphic report of the transactions of the Annual Meeting of the Society which was held in New York on May 20th.

Mr. E. A. Gruppe, Secretary-Treasurer of the Chapter, in his report of the meeting, advises that the Chapter is embarking upon an educational publicity campaign to acquaint the citizens of the County, through the medium of the public press, with the regulations governing the practice of Engineering and Surveying which have for their sole legally declared purpose the safeguarding of the life, health and property of the people of the State. In furtherance of this campaign a special publicity committee was appointed, to prepare for publication a resume of the amendments to the sections of the Education Law applying to Engineering and Surveying which were adopted at the last session of the State Legislature.

* * *

ROCKLAND COUNTY

The Rockland County Chapter held a meeting at the Supreme Court Chambers in Nyack on June 1st.

The guest speaker, Raphael J. Smyth, Chairman of the Chapter Activities Committee, who has been actively associated with the Society from its inception, outlined the fundamental philosophy of action upon which is supported all of the activities of the Society and its Chapters. He briefly described the growth of the Society in membership and influence, and of the advancement it has made under the wise and progressive leadership of its successive presidents to the commanding position it now occupies in the Engineering legislative field in the State.

The Secretary of the Chapter, Mr. Anthony B. Chester, (to whose courteous co-operation this report is due) reported that he has personal knowledge of six cases of illegal practice in the County. The matter of these alleged violations of law was referred to the Legislative Committee for immediate investigation.

The Board of Directors of the Chapter held a meeting on June 12th at the County Engineers Office at which the following program of activities was decided upon:

(1) The establishment of a Building Code for Rockland County, in which work the co-operation of the Architects of the County will be invited.

(2) The transmission to the County Clerk of a list of the names of the licensed Engineers and Surveyors who reside in the County to assist in the enforcement of the legal requirement that land surveys be made and plotted by licensed land surveyors and also to require observance of the legal restrictions which are placed upon surveyors, licensed in one State, to practice in a State in which they are not licensed.

(3) The contribution of articles to the news publications of the County in order that information might be more widely disseminated regarding the protective objectives of the licensing law and of the functions and accomplishments of the engineering profession.

* * *

QUEENS COUNTY

The following statement and resolution has been received for publication through the courtesy of J. Franklin Perrine, President of the Queens County Chapter:

"The Borough of Queens must elect a Borough President this November to serve as the Chief Executive of the Borough for the next four years; the people of this County are entitled to the best representative.

WITNESSETH:

WHEREAS, the vast majority of the problems that must be solved by the office of the Borough President of this County is intrinsically technical and of an engineering nature, demanding the knowledge of one properly trained and equipped along technical engineering lines, and

WHEREAS, it is a fact that numerous large cities in the United States now have as the Chief Executive a man technically trained in the science of engineering, and

WHEREAS, the three main subdivisions of the Borough President's Office are now in charge of engineers, namely, the Bureau of Sewers, Bureau of Highways, and the Topographical Bureau, and

WHEREAS, it is universally conceded that the Borough of Queens is still comparatively undeveloped when compared with the Boroughs of Manhattan, Bronx and Brooklyn, and is yet in its infancy, demanding and requiring vast developments and improvements in connection with transportation, highways, sewers, Borough planning and zoning and other kindred problems, all of a highly technical nature, and

WHEREAS, the bulk of the matters presented before the Board of Estimate and Apportionment deal with technical problems such as sewers, highways, transportation, sanitation, water supply and other correlated subjects, not only insofar as these affect directly Queens County, but in their relationship to the Greater City of New York, and

WHEREAS, manifestly, from a perusal of the foregoing, and a disinterested and dispassionate review and study of the same, it is apparent that the services of a man are required as President of the Borough of Queens, who is, by training, by past performances, by equipment, by education and by experience, best suited to discharge the duties of such office,

NOW, THEREFORE, BE IT RESOLVED that we, the undersigned, the QUEENS COUNTY CHAPTER OF THE NEW YORK STATE SOCIETY OF PROFESSIONAL ENGINEERS, at a regular convention of the Chapter held on the 25th day of May, 1933, at the Queens County Medical Society Building, Queens Boulevard, heartily endorse and recommend J. FRANKLIN PERRINE, . . . for the office of President of the Borough of Queens; and be it further

RESOLVED, that a copy of this resolution, together with a categorical outline of the history and career of Mr. Perrine be forwarded by a Committee to . . . the authorities, leaders, citizens and press of Queens County and Borough.

"IN WITNESS WHEREOF we have hereunto set our hand and seal this 25th day of May, 1933.

QUEENS COUNTY CHAPTER THE NEW YORK STATE SOCIETY OF PROFESSIONAL ENGINEERS.
By Martin Nelson, Executive Secretary.'" *

* Editorial privilege exercised.

It has been urged frequently and generally that the selection of Engineers as heads of governmental agencies and as members of Commissions, boards and authorities charged with the prosecution of Engineering works would be of public benefit. That the seed of this thought is germinating promisingly in the Borough of Queens is evidenced by the fact that two Engineers are now being considered as possible nominees for the office of the Presidency of the Borough of Queens—J. Franklin Perrine, Chief Engineer of Sewers, and Andrew K. Johnson, Chief Engineer of Highways, —both of the Borough of Queens. The candidacies of these Engineers have been launched on the political waters and are now advancing encouragingly under the propulsion of endorsements of citizen organizations and Engineering groups.

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New Jersey News and Activities

(Continued from Page 15)

in the past year's broadcast program. It is hoped that they will continue to give the same hearty co-operation and effort towards the success of next year's program.

E. F. WEEKS.

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New Jersey Chapter News

ERNEST F. WEEKS
Chairman of Chapter Activities Committee

BERGEN COUNTY

A meeting of the Chapter was held in the Green Room of the Bergenfield Elk's Club, at Bergenfield, on Thursday, June 22, 1933 at 8:15 P. M.

After a short business session the meeting was turned over to the program committee, which was particularly fortunate in obtaining speakers on a subject which was of great interest to all.

Mr. George DeGarmo, President and General Manager, and Mr. Hamilton Maxwell, Head of the Photographic Section of the Standard Flying Service of Hackensack and Tetorboro, N. J., spoke on Aerial Photography and Aerial Photographic Surveying and Mapping.

Mr. David C. Boswell, Civil Engineer, of Ridgefield Park and Hackensack discoursed on Aerial Surveying and Mapping with particular reference to its use in connection with the making of Tax Assessment Maps.

Discussion followed the talks.

This topic which, while still new enough to excite interest, has proven

its value as testified to by its continued use by Governmental Agencies and Industrialists.

Chapter Dues this year are two (2) dollars of which one (1) dollar is paid to the State Association for your membership therein. Cards indicating that the holder is a member in good standing of both the Chapter and State Association have been received for distribution and are awaiting your call. This is not intended to be a dun and DUES or NO DUES we want you to come to these meetings.

WALTER M. SCHIRRA,
Secretary.

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MONMOUTH COUNTY

The Monmouth County Chapter has appointed a Committee to arrange for its annual Clam Bake which will be held early in September.

It has been suggested that it be made an all-day affair with golf and tennis tournaments, boating and swimming preceding the bake.

The price of the tickets will be on the economy basis with no reduction in the quality and quantity of the "goods."

J. H. Emlen, 221 Main St., Avon, is chairman of the committee and will welcome all requests for information.

Regular Chapter meetings have been suspended for the summer.

Monmouth County Chapter, Professional Engineers and Land Surveyors, will hold their next meeting at Shark River Hills Hotel, near Belmar, N. J., at which time they will hold their annual clambake.

The committee has made arrangements for an all-day outing, with boating, bathing, tennis and golf; playgrounds for the kiddies; a good dinner at the depression price of $2.00.

Let's all go early—bring our family and friends for a real old get-together!

Send for your tickets early and help the committee with the arrangements. Don't forget that kiddies can come for half price.

The committee in charge is to be congratulated on its success in arranging for such a good time at such low prices.

You may obtain tickets from Mr. J. H. Emlin, 221 Main Street, Avon, N. J.; Mr. Claude Birdsall, F. Street near 17th Avenue, Belmar; Mr. O. Seaman, 442 Dewey Street, Long Branch, N. J.; Mr. Geo. Randolph, 60 Broad Street, Red Bank, N. J., or the secretary, L. K. McKee, 16 McLaren Street, Red Bank, N. J.

LEO K. McKEE,
Secretary.

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SOUTH JERSEY CHAPTER

At a recent meeting of the South Jersey Chapter of the New Jersey Society of Professional Engineers and Land Surveyors, held in the offices of H. M. Schmucker, President, the following was decided:

A meeting will be held on Saturday, July 29th, at the Ocean City Golf Club (Somers Point, 2 miles away). It will be in the nature of an outing with golf, bathing, sailing and cards for the ladies. As this will be a seashore get together of Engineers it is expected that a great many will attend. Minimum rates will prevail. 18 holes of golf can be had for $1.25. Dinner at 7:15 P. M. will feature sea food or meat at $.70 per cover. Ladies are to be entertained by a local committee. Those wishing to stay over night can do so at The Somers (Commodore Richard Somers of the historical Battle of Tripoli) Mansion in Somers Point at $1.00 each. Ocean City is two miles away over the $1,000,000 new State Highway bridge where similar or more expensive accommodations are available.

Members and their friends from all Chapters are welcome to this major get together of New Jersey Engineers and a reception committee will be on hand from day-break on Saturday, July 29. A fifteen minute movie of the nearby Ocean City-Somers Point World War Memorial Bridges will be the only technical feature of the ladies' and men's dinner in the evening.

For those who desire bathing at Ocean City lunch can be obtained at an up-to-date beach front hotel for $.50 where you will be permitted to eat in bathing suits and there will be no charge for locker room, showers or parking.

Dancing starts at 10:00 o'clock with an excellent orchestra, and the fee of $1.00 includes a midnight breakfast.

South Jersey County Engineers as a group are a General Committee for this affair, which has been contracted for mid-season at bottom rates, in order to "get you there" and a fine showing of North and Central Jersey Engineers is hoped for. New York State Engineers please note that there is a prize for the greatest speedometer reading.

If Engineers do not show any pep in these times who else will? Come on down to the shore on the 29th. Send in reservations *now* to the Chairman, Morgan Hand, Jr., 1401 Pleasure Avenue, Resident Engineer, State Highway Department, Ocean City, New Jersey, Phone 1139-R.

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MIDDLESEX COUNTY

The last meeting of the Middlesex County Chapter was on May 15th.

This meeting was held at the Elks Club in New Brunswick, N. J. The business and social part of the program was preceded by a dinner, after which there was a talk by Dr. Eugene Agger of Rutgers University. His topic was "Inflation As a Means of Business Recovery." This talk proved most interesting as were Dr. Agger's explanations of the subject covering the complicated handling of finances and the gold standard.

Several members of this chapter have been, and a few are still to go, on the air during the present series of the Associations radio broadcasts.

The subjects alloted the chapter for the fall episodes have been completed and turned in for dramatization.

ESSEX COUNTY

The only activity of the Essex County Chapter this month has been a meeting of the Executive Committee held Thursday, June 15.

This meeting was called to discuss the drastic salary reductions of employes of the City of Newark Engineering Department. While one cannot at this time report on a definite plan of action, the Chapter will protest to the City Commission on the discrimination against the engineers.

The attached clipping from the Newark Evening News gives the present and proposed salary of the engineers, many of whom are members of the Essex County Chapter.

SALARY CUTS FOR NEWARK CITY EMPLOYEES

	Base Salary	Present Salary	New Salary
James W. Costello, chief engineer	$ 15,000	$ 11,250.00	$ 6,000
Richard Aldworth, airport supt. & mgr.	12,500	9,750.00	4,250
Ralph Smillie, engineer of design	12,000	9,360.00	5,000
Goline Doremus, dept. chief engineer	8,500	6,800.00	4,500
Herman Rosentreter, division engineer	8,000	6,400.00	4,500
Morris R. Sherrerd, consulting engineer	7,500	6,075.00	4,000
John W. Judson, chief accountant	7,500	6,075.00	4,000
Edward S. Rankin, division engineer	7,000	5,670.00	4,000
L. Dudley Coles, asst. chief engineer	6,500	5,265.00	4,000
Eberhard Welle, asst. design engineer	6,500	5,265.00	3,000
Charles L. Crandall, const. engineer	6,500	5,265.00	3,000
Walter W. Kane, eng. in charge surveys	6,000	4,920.00	3,600
Geo. W. Andress, engr. in charge streets	6,000	4,920.00	3,600
Raymond J. Dempsey, supt. Port Newark	6,000	4,920.00	4,250
James W. Alden, engr. in charge motors	5,500	4,565.00	3,600
Wm. G. Bank, asst. div. eng. water	5,300	4,399.00	3,900
Robert O. Scholz, engr. in charge water	5,300	4,399.00	3,300
Mahlon W. Parsons, engr. in charge docks	5,200	4,316.00	3,300
Thomas Darrow, res. constr. engineer	5,200	4,316.00	3,000
Ward W. Slawson, elec. engineer	5,000	4,250.00	3,000
James E. Garrett, design engr.	5,000	4,250.00	3,600
Joseph C. Imhoff, asst. design engr.	4,800	4,080.00	3,000
Leonard S. Whippen, asst. design engr.	4,800	4,080.00	3,000
Walter J. Walters, supt. of repairs	4,800	4,080.00	3,500
William A. Adams, supt. of pur.	4,500	3,825.00	3,000
Arthur Bradley, prin. asst. engr.	4,500	3,825.00	3,000
Ellsworth Francisco, engr. in charge l't'g.	4,500	3,825.00	3,000
Val. Hermann, supt. of st. cleaning	4,200	3,654.00	3,000
Herbert Simon, asst. engineer	4,200	3,654.00	3,000
Walter Roder, asst. engineer	4,200	3,654.00	3,000
Chester Mueller, prin. asst. engr.	4,000	3,520.00	3,000
Walter Baver, design. engr.	4,000	3,520.00	3,000
Arthur J. Simpson, asst. engr.	4,000	3,520.00	3,000
Fred'k Scherer, supt. of main. & const.	3,900	3,432.00	2,700
Thomas W. Reilly, supt. of watershed	3,900	3,432.00	2,700
Elmer Peloubet, asst. engineer	3,900	3,432.00	3,000
John A. Schieck, prin. asst. engineer	3,900	3,432.00	2,900
Joseph Murray, engr. of spec. assmts.	3,600	3,204.00	3,000
William Brock, supt. of st. rep.	3,600	3,204.00	3,000
Frank Broadwell, supt. of sewers	3,600	3,204.00	2,500
John Flockhart, asst. engineer	3,600	3,204.00	3,000
Jules Rath, supt. of stables	3,600	3,204.00	2,900
Reuben B. Azhderian, asst. engr.	3,420	3,043.80	2,700
Charles P. Woodnut, asst. engineer	3,600	3,204.00	2,700
Charles B. O'Connor, asst. engineer	3,600	3,204.00	2,700
Totals	$248,720	$206,866.80	$151,700

Meetings of the chapter have been discontinued during the summer months but will start again in September.

DANIEL M. VAIL,
Secretary
City Hall,
New Brunswick, N. J.

* * *

PASSAIC COUNTY

The last meeting of the year was held on June 22nd at the Elmwood Country Club, East Paterson, New Jersey. This meeting was a good fellowship gathering devoid of the usual formalities. A five course dinner with beer ushered in the festivities at 7:00 P. M. After dinner there were golf contests. At dark those present adjourned to the grill for a short business meeting, and the installation of the newly elected Chapter officers. The meeting was then turned over to the Entertainment Committee for the balance of the evening.

Notices have been sent to all of the licensed engineers in the county soliciting their active membership in Chapter activities. The payment of dues is secondary, though necessary in order to carry on the work of the Association. What we want is their attendance and support of the work we are doing.

Every licensed engineer an active member is Passaic County Chapter's slogan.

E. F. WEEKS,
Secretary.

LICENSES GRANTED

June, 1933

*Andrews, Eric A.
White Plains, N. Y.

Baltimore, Garnet D.
Troy, N. Y.

Boileau, Willard E.
Bath, N. Y.

Bernard, Matthias
Richmond Hill, N. Y.

Braley, Howard D.
New York, N. Y.

Carroll, Hugh J.
Yonkers, N. Y.

Chambers, Joseph L.
New Dorp, S. I.

Clark, Harry G.
E. Syracuse, N. Y.

*Clark, Walter D.
Massena, N. Y.

*Clarke, Francis W.
St. Albans

Clegg, T. Herbert
Philadelphia, Pa.

Clossay, George
New York, N. Y.

Cooper, James A.
Brooklyn, N. Y.

Corte, Anthony S.
New York, N. Y.

Cox, Edmund O.
Yonkers, N. Y.

Crowell, E. Philip
Syracuse, N. Y.

d'Antona, Louis
New York, N. Y.

Dexter, Harris E.
Poughkeepsie, N. Y.

Edwards, Harold H.
New York, N. Y.

Elkin, Joseph J.
New York, N. Y.

Foote, Edward B.
Rochester, N. Y.

Hecker, Chas. H.
Potsdam, N. Y.

Hoy, Chas. W.
Glassboro, N. J.

Hyland, Richard V.
New York, N. Y.

Kermer, Martin J.
Buffalo, N. Y.

*Ketchum, A. Raymond
Clyde, N. Y.

Kilcarr, Gilbert M.
New York, N. Y.

Knopf, Sidney H.
New York, N. Y.

*Knowles, Coyle E.
Gowanda, N. Y.

Mantell, Chas. L.
Brooklyn, N. Y.

*Marble, Thos. F.
Ithaca, N. Y.

Mattheis, Aaron
Nutley, N. J.

*Matsunaye, Wm. S. Jr.
Medford, N. Y.

Norcom, George D.
Redbank, N. J.

Nugent, Wm. R.
Forest Hills, L. I.

*Olewiler, William N.
Ossining, N. Y.

O'Regan, Stephen P.
St. George, S. I.

Pfabe, Ernst E.
Laurelton, L. I.

Pritchard, Randolph H.
Albany, N. Y.

Ritchie, Edward W.
Brooklyn, N. Y.

Roberts, A. Perry
New York, N. Y.

Rosen, Nahum J.
Bronx, N. Y.

Saville, Thorndike
Spuyten-Duyvil, Bronx

Sawdon, Will M.
Ithaca, N. Y.

Scott, Lester C.
Brooklyn, N. Y.

Smiley, Leon R.
Albany, N. Y.

*Smith, George R.
Pleasantville, N. Y.

*Springer, R. C.
New York, N. Y.

Tchikoff, Valentine V.
New York, N. Y.

*Terhune, Frederick W.
Pleasant Valley, N. Y.

*Tiesler, John A.
Pleasantville, N. Y.

*Tryon, Henry H.
Cornwall-on-Hudson

Wade, Jeptha A.
Maplewood, N. J.

Walter, Otto W.
Hastings-on-Hudson

Ward, Frank T.
Mamaroneck, N. Y.

Ward, Harley M.
New York, N. Y.

Weymouth, Thomas R.
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* Land Surveyor only.

Notice To Engineers and Their Friends

Notice is hereby given that the Monmouth County Chapter of Professional Engineers and Land Surveyors will hold its annual shore dinner and outing at the Shark River Hills Hotel, on Shark River, near Belmar, N. J., on Saturday, September 9, 1933.

Plans have been prepared for our friends to enjoy Boating, Bathing, Tennis and Golf. There will be a play ground and safe bathing for the kiddies.

A committee will be on the grounds to greet you at 10:30 A. M., Daylight Saving Time.

Dinner will be served at 2:30 P. M. Tickets for the dinner have been filed with the Secretary, Leo K. McKee, at 60 Broad Street, Red Bank, N. J., and will be furnished to prospective visitors upon payment of two (2) dollars for adults and one (1) dollar for children.

Reservations must be made on or before Wednesday, September 6, 1933.

A copy of the specifications for the dinner and a map of directions to the site will be furnished upon application to the Secretary.

The Hotel Management offers special rates for the week-end to Engineers and their friends.

You are requested to arrive early, to bring your wives and kiddies and to stay late.

By order of the Dinner Committee of the Monmouth County Chapter of Professional Engineers and Land Surveyors.

J. H. EMLEN, Chairman.

Attest: LEO K. McKEE, secy.

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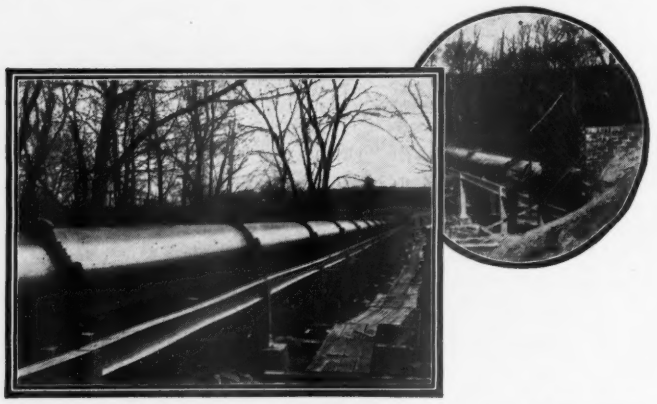

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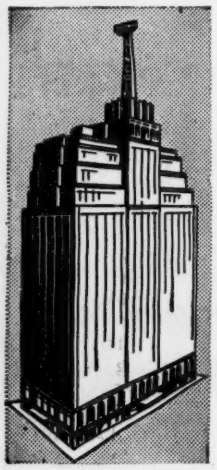

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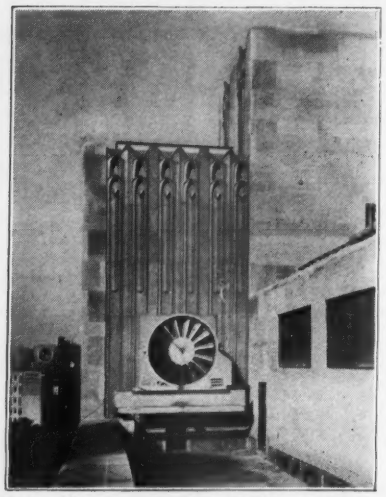

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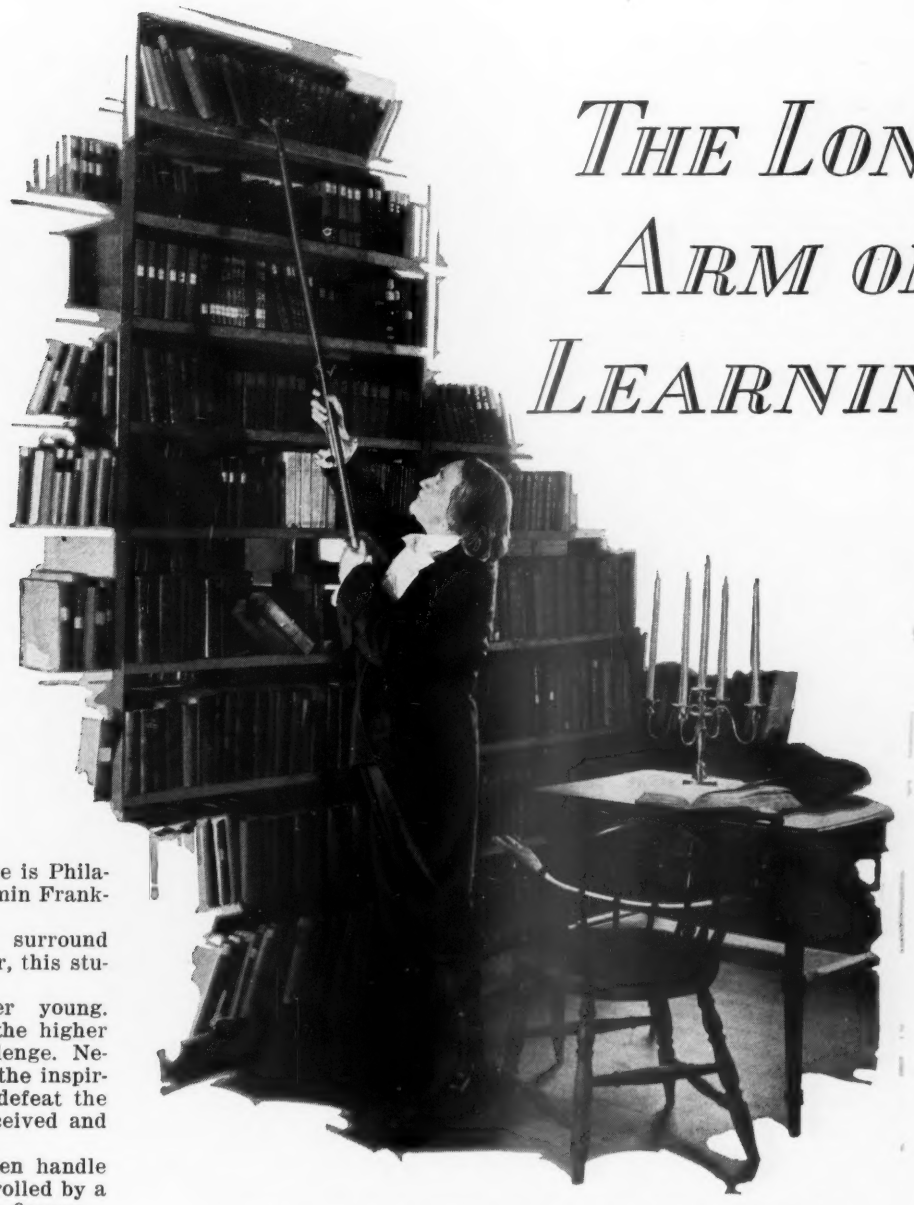

Specially posed by Franklin Bache Huntington, a direct descendent of Benjamin Franklin, in the Philadelphia library founded by Franklin. Some of the books here were donated by Franklin, with his autograph inscribed on the fly leaves.

THE YEAR IS 1787. The place is Philadelphia. The scene is Benjamin Franklin's library.

Bookcases, rising high, surround him, this homely philosopher, this student, inventor and patriot.

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